

HC
265
H86wE

A
A
0
0
1
2
6
8
6
1
5
0



UC SOUTHERN REGIONAL LIBRARY FACILITY

THE
ECONOMIC RESOURCES
OF
AUSTRIA

BY

DR. KARL HUDECZEK

AUTHORIZED TRANSLATION BY JULIA F. FIEBEGER

WITH TWO MAPS

1922

MANZ PUBLISHER

20 KOHLMARKT VII NNA



SOUTHERN BRANCH,
UNIVERSITY OF CALIFORNIA,
LIBRARY,
LOS ANGELES, CALIF.

THE
ECONOMIC RESOURCES
OF
AUSTRIA

BY
DR. KARL HUDECZEK

AUTHORIZED TRANSLATION BY JULIA F. FIEBEGER

WITH TWO MAPS

1922

MANZ PUBLISHER

20 KOHLMARKT VIENNA

69327

Copyright by Manz Verlag Vienna

ABSTRACTS TO VOLUME
NO. 10 WATER 1938

Printed at the Printing-Office of the Publisher, Vienna IX

2-5-11
11
42
265
512215

Preface.

— —

18
922
92
5213

The purpose of the present work is to give a picture of the productive resources of Austria. It will show in what lines the Republic of Austria is capable of production, the hindrances, their causes, and finally the economic relations of Austria with the Succession States that have arisen on the territory of the Austro-Hungarian Monarchy, and its connections with other foreign countries.

The investigation comprises only the chief branches of economic activity. In order to preserve as clear a view as possible we have had to refrain from any examination of details.

Nevertheless, for the benefit of those who are interested practically and wish special information we have given the names of the associations of the several Austrian industries and the names of some of the larger firms in the different branches of production.

The translation of the book, the second edition of which appeared in German in July 1921 was made by Miss Julia F. Fiebeger. I here heartily thank her for the great trouble she took with this work. I also take advantage of this opportunity again to express my gratitude to Mr. William Ford Upson, American Trade Commissioner in Vienna, for his kind interest and encouragement.

Vienna, December 1921.

Dr. Karl Hudeczek.

The Weights and Measures

used in this work are:

The metric ton (t) which equals 2204·62 lbs.

The quintal (q) which equals 220·46 lbs.

The hectare (ha) of land which equals 2·47 acres.

The square kilometer (km^2) which equals 100 hectares, or about 0·4 square miles.

The liter (l) which equals 1·06 quarts.

The hectoliter (hl) which equals 100 liters, or 26·42 gallons.

Index.

	Page
I. Geography and Population	7
II. Rural Economy	10
1) Agriculture	11
2) Animal breeding	13
3) Forestry	15
III. Industry	17
1) Iron	20
2) Textiles	28
3) Wood	36
4) Paper	38
5) Electrical machines and apparatus	40
6) Rubber	43
7) Leather and Manufactures of Leather	44
8) Chemicals	45
9) Magnesite, Cement, Brick and Tiles	46
10) Mining	48
11) Provisions (Sugar, Salt, Beer and Malt, Flour, Alcohol and Compressed Yeast).	50
12) Arts and Crafts and Various Other Industries	54
13) Raw Material Required	56
IV. Power	60
1) Coal	61
2) Petroleum	64
3) Water Power	65
V. Banks	70

Supplement:

Maps: Austria according to the Peace Treaty of St. Germain-en-Laye of
September 2, 1919.
The New Austria in comparison with the Austro-Hungarian Monarchy.

I. Geography and Population.

The Austrian Republic has in round figures an area of 84,000 square kilometers and a population of 6 $\frac{1}{2}$ million inhabitants.¹ Of its area, 4300 square kilometers, with 345,000 inhabitants, constitute West Hungary, which was allotted to Austria by the Peace Treaty.

The Republic of Austria is in area about one quarter of the former Austria, or one-eighth of the former economic territory of the Austro-Hungarian Monarchy.

In its present state, it is most like Bavaria: their size and population are almost equal, and their peoples are nearly related in blood. A comparison with other countries shows that Austria is about twice as large as Belgium, Holland, or Switzerland, and has the same number of inhabitants as Holland.

Country	Area in square kilometers	Inhabitants, in millions	Population per square kilometer
Austria	84,000	6.5	78
Bavaria	76,000	6.9	91
Belgium	29,000	7.4	255
Holland	34,000	6.6	194
Switzerland	41,000	3.7	91

Austria is similar to Switzerland in its situation and in the nature of its land, lying as it does in central Europe and being very mountainous in character, with the consequent hindrances to an agricultural production sufficient for its domestic

¹ Statistisches Handbuch für die Republik Österreich. 1. Jahrgang, Vienna 1920. The preliminary results of the last census of the year 1920 as well as a list of communities were published as a pamphlet of "Beiträge zur Statistik der Republik Österreich" by the "Statistische Zentralkommission" in Vienna. On the State territory see "Statistische Monatsschrift, 3. Folge, I Jahrgang", Vienna 1919, page 214.

needs. It is therefore forced to import large quantities of provisions and to make good an unfavorable trade balance by industrial and commercial production and service if its existence is to be preserved.

The basis of a great transit commerce is laid by the geographical situation of the country. The important lines from Germany to the Mediterranean go, some through Switzerland and some through the Tyrol and the Eastern Alps to the Adriatic. The lines from Western Europe to South Eastern Europe and Asia Minor lead naturally through Austria, intersecting at Vienna the commercial route from Czecho-Slovakia to the Adriatic. This position at the natural intersection of the lines from West to East and from North to South ensures to Austria lasting importance. In spite of all the obstacles which have been placed in the way of trade with Vienna in the last two years, its predominant position as an intermediate market for Eastern Central Europe is to-day undisputed. The restoration of normal conditions in the Orient and in Eastern Europe promises a further development at a time not far distant.

According to nationality, 95 % of the population of Austria are Germans, and Austria is by far the most homogeneous national State among those which have arisen on the territory of the Austro-Hungarian Monarchy.

A picture of the social structure of Austria, according to occupations, throws much light upon its economic character.² According to the statistics of the year 1910, of those who are engaged in occupations in Austria, excluding West Hungary, there are in

Agriculture and forestry	40 %
Industry and handicraft	35 %
Trade and commerce	17 %
Public service and professions	8 %

Agriculture has indeed a very great importance for Austria; nevertheless it is secondary to industry, handicraft, trade and

² Dr. Gustav Stolper, "Die soziale Struktur Deutschösterreichs" (Der österreichische Volkswirt, XII. Jahrgang, Nr. 12). "Der Geist des deutschösterreichischen Wirtschaftslebens" (158. Band der Schriften des Vereines für Sozialpolitik, München 1919, page 129).

commerce, which are constantly increasing. The comparatively great number of those who are engaged in trade and commerce is a sign of the importance of Austria in those lines.

Almost 70% of those who are engaged in industry and handicraft are in Vienna and the region immediately around it. Here is the great center of industry and finance of the former Austro-Hungarian Monarchy, against which there exist in the other parts of present day Austria only scattered concerns, some of them it is true very large, and these are with few exceptions controlled from Vienna. According to size, after Vienna with its 1·8 million inhabitants come the cities of Graz with 157,000, Linz with 93,000 and Innsbruck with 56,000.

As the metropolis of a great economic territory of about 50 million inhabitants, Vienna used its powers for the most part in the more productive territories of the present Succession States, while the Alpine lands were imperfectly exploited in the expansion of their industry, the development of their water power, the industrialization of their agriculture, and the promotion of their tourist traffic. In the future far greater activity will be shown in this direction and it is to be hoped that the Alpine lands will soon prosper after the pattern of Switzerland. The economic importance of Vienna for the other parts of the former Austria-Hungary has after all not been so much diminished by the political events of recent years as perhaps appeared immediately after the dissolution. On the contrary the course of events in the two years since the war has clearly shown that Vienna, on account of its great banks and industrial companies which control most of the production of the Succession States, and on account of its peculiar importance as an international market, still remains a central point whose function is to form a connecting link between Eastern Central Europe and world commerce.

II. Rural Economy.³

Because it is one of the most mountainous countries of Europe, Austria can unfortunately not develop its agriculture to the full extent in every direction. It is impossible for it to bring its production to the level which is reached in the fertile lands of Germany and of Czechoslovakia.

By far the greater part of the land in Austria is in small or medium sized holdings. Only 6·1% of agricultural land is in farms of more than 100 hectares each. Of woodlands, almost 50% is in large estates, that is, over 500 hectares each.

The exploitation of the land is as follows, the figures for Germany being added for comparison:

	Austria:	Germany:
Fields and gardens	24 %	48·6%
Woods	38 %	25·9%
Meadows	11 %	11 %
Pastures	16 %	5 %
Vineyards	0·6%	0·2%
Unproductive	10·4%	9 3%

While in Germany 48% of the land can be used for agriculture, in mountainous Austria only 24% can be used, since in consequence of geographical conditions agriculture is necessarily

³ See: Wirtschaftsstatistische Materialien über Deutschösterreich, compiled by the Niederösterreichische Handels- und Gewerbekammer, Vienna 1919, tables 7 to 24; Die Volkswirtschaft der Nationalstaaten, published by the Allgemeine Depositenbank, Vienna 1921; Siegfried Strakosch: Ackerwirtschaft in Deutschösterreich (158. Band der Schriften des Vereines für Sozialpolitik, München 1919, page 105); Dr. Michael Hainisch: Die Aussichten der Rindviehzucht in Deutschösterreich (158. Band der Schriften des Vereines für Sozialpolitik, München 1919, page 19); Julius Marchet: Waldflächen und Holzproduktion von Österreich. Vienna 1919; Dr. Gustav Stolper: Die Landwirtschaft (Der österreichische Volkswirt, 12. Jahrgang, Nr. 15).

restricted to the lower slopes of the Alpine region, the approaches to the Alps, and the plains of Lower Austria and Upper Austria. On account of the natural conditions, forestry and animal husbandry must always occupy the first place, and although the present area of the tilled land does not exhaust the possibilities Austria will always be able to provide herself better with animal products than with agricultural.

1. Agriculture.

While the economic territory of the Austro-Hungarian Monarchy practically covered its needs in agricultural products until very recent years through its own production, the Republic of Austria on account of the erection of the present frontiers must always have a great deficit. This deficit will remain even when a considerable increase of production is reached through improvement of agricultural methods, which are now very oldfashioned in many cases, extensive employment of machines, and a certain increase of agricultural land, that is still possible. This is true because the mountainous character of the land not only limits to a small area the extension of tilled soil, but also in very great measure restricts the average production per hectare.

The agricultural land in Austria, exclusive of West Hungary, measured in the last year before the war 1·8 million hectares so that there were about 30 hectares, per hundred inhabitants, as compared with 50 hectares in the former Austro-Hungarian Monarchy.

The area cultivated with the most important grains on the average of the years that immediately preceded the war, that is 1904 to 1913, was only 1·1 million hectares. The yield of the most important grains in those years was as follows:

	Total yield	per hectare
	metric tons	
Wheat	254,000	1·35
Barley	170,000	1·25
Rye	553,000	1·35
Oats	365,000	1·12
Maize	70,000	1·50
Total	1,412,000	

Thus the territory of the Republic of Austria produced on the average, in round numbers 1,400,000 tons of grain per year. That is only 2·3 *q* per capita, as against 4·4 *q* per capita in the Austro-Hungarian Monarchy, which latter amount hardly covered the consumption. But according to official estimates the harvests of the most important grains in the years since the war, on account of the lack of fertilizers and the general difficulties of production have amounted to much less than the production of peace years. To maintain present food conditions, the importation of some 300,000 to 400,000 tons yearly of bread grains alone would be necessary.

The yield per hectare, on account of the poverty of the soil and the fact that a great part of the arable land lies at an altitude of over 800 meters, is only about $\frac{2}{3}$ of the yield in Germany.

The state of things with respect to the supply of potatoes is still worse. The cultivated area amounted in peace time to about 140,000 hectares. The average yield per hectare was about 90 *q*. With a total crop of 12·5 million *q* there remained after deducting seed potatoes an average of scarcely 150 kilograms per capita of the population of the Republic of Austria, as against more than 350 kilograms in Old Austria, so that great imports of potatoes for food and industrial purposes will be necessary in the immediate future.

Of sugar beets the territory of the present Republic of Austria formerly produced 40 kilos per capita, as against 215 kilos in the whole of Old Austria. On account of the lack of the fertilizers that are absolutely necessary for the cultivation of sugar beets, and on account of the lessening of the cultivated area, this production has receded still further in recent years. Even when the condition of 1913 is again reached, Austria will not be able to obtain the sugar needed from its own beet crop. Any considerable extension of beet cultivation meets with difficulties on account of the special nature of the soil which the beet requires.

The culture of poppy seed, hemp, flax and other commercial plants appears to be especially capable of extension. Lower Austria and Styria, with a production together of 1·1 million hectoliters of wine are most capable of production in that line. Fruit culture also seems to be especially capable of extension and improvement.

The great diminution of domestic production has been partly compensated in the last two years by the help of the Allies, so that, with the most severe restrictions, it was possible to get along. If the population of Austria is to be helped in a permanent way instead of by makeshifts, we must plan first of all for the greatest possible exploitation of its own sources of production. In the case of agriculture the first thing to do would be to make it possible to obtain a good supply of artificial fertilizers. Only a small amount of manure is available on account of the unfavorable fodder situation in the cattle raising industry. Almost all of the artificial fertilizers must be imported from abroad, ammonium sulphate is the only one of which enough can be produced within the country. The amount of fertilizer normally needed for the land planted in bread grains and potatoes, given a rational use, and the present insufficient supply are shown in the following table:

	Needed	Probable supply 1921
	Metric tons	
Potash Fertilizers	42,500	6,500
Superphosphate and Basic Slag .	145,000	18,000
Nitrogen Fertilizers	40,000	7,000

The money required for securing these quantities of artificial fertilizers amounts truly to a considerable sum; on the other hand one must consider that through the employment of this necessary agricultural material the crops would increase in very great measure, so that the balance of trade could be very much improved by avoiding the necessity of great imports of provisions.

2. Animal breeding.

In Austria animal breeding is far better developed than agriculture, since the Alpine Provinces by nature are excellently adapted to raising sound, strong animals.

In the Alpine regions there were in the year 1910, an average of 352 cattle per 1,000 inhabitants, as against 333 cattle in the whole Monarchy. The great demand for consumption in war time and the lack of concentrated feed have caused a retrogression since 1910. The results of the animal census for the territory of

the present Austrian Republic in April, 1919, excluding West Hungary, are:

	Total number	per 1000 inhabitants
Horses	236,000	39
Cattle	1,952,000	322
Pigs	1,107,000	182
Sheep	317,000	52
Goats	289,000	48

The diminution, as compared with the census of 1910 is estimated at 40% in the case of pigs and about 20% in the case of cows. Especially dangerous is the great diminution of breeding cattle, since it requires several years to raise them. The fact that the last census showed a great increase in the number of young cattle might be regarded as an encouraging sign if it were not that many of the young cattle have been retarded in their growth by lack of necessary feed. In the case of pigs, a restoration to the former condition is possible in a much shorter time than in the case of cattle given sufficient feed. It is especially unfortunate for the provisioning of the city populations that the herds of the great proprietors are the very ones that have been requisitioned up to and even beyond 50%. Besides the diminution in the number of animals it is especially bad for the meat and fat supply of the people that the quality of the animals has deteriorated on account of the lack of concentrated feed.

The raising of fowls has always been a specialty of the Alpine regions of Styria and Upper Austria. At the census in 1910, the number of chickens, geese and ducks was 6.7 millions, which means about one per capita of the population. Here too the war made great inroads, but on account of the favorable natural conditions, restoration should be easy. The improvement of methods of breeding and feeding, which are now on quite a low plane, offers special possibilities.

In like manner as a sufficient supply of fertilizers is the prerequisite of an improvement of agricultural production, the improvement of the domestic animal raising must begin with a provision of the absolutely necessary concentrated feed, at reasonable prices. It would then be easily possible to produce cattle which when slaughtered would give satisfactory results, and to bring the young cattle up to a strongly developed new generation.

The improvement of animal breeding appears to be a prerequisite to any improvement of agriculture, since draft animals and fertilizer, the results of cattle breeding, are indispensable to an increased agricultural production and to the attainment of a greater fertility. What great success can be had in this very field is shown by the fact that even in time of peace the cattle in Austria were 15% behind those in Switzerland and that the milk production in Austria under normal conditions is estimated at 1800 liters per cow per year, while in Switzerland it is from 40 to 50% higher.

On summing up the results we see that it would be easily possible in Austria to improve agriculture to such an extent that it could supply a far greater part of the need than heretofore, although on account of the poor soil imports will always be necessary.

On the other hand, in animals and animal products a condition almost of independence could be reached, but only in the course of time. Austria would have to continue importing fat and meat in considerable quantities, but could in return export young cattle and breeding cattle of high value.

3. Forestry.

The rich supply of wood in Austria forms one of the most important items of its production: In round figures 3 million hectares or 38% of its area, not counting West Hungary, is covered with forest. Austria thus is among the countries that are most thickly wooded, and is inferior in this respect only to Finland (46%), Sweden (44%), Russia (39%) and Canada (39%).

It appears, indeed, unfavorable for their exploitation that more of the forests are not in large estates, and that they are in part in high mountain regions where it is very difficult to bring out the wood and where a great part of the forests are protected and require an especially careful and restrained exploitation. The great forest estates, that is those of over 500 hectares each, amount in Austria to 1.4 million hectares altogether, other holdings, to 1.6 million hectares. Of the great estates, almost $\frac{1}{3}$ are government property (400,000 hectares)

chiefly situated in Salzburg and the Tyrol; 20% are municipal property; the rest, private property. The greater part of the large private estates lie in Lower Austria and Styria.

With a total wooded area of about 3 million hectares, the yield of wood can be taken as about 9 million cubicmeters (3 cubicmeters per hectare). The production consists for the most part of soft wood, since about 74% of all the forests in Austria are of evergreens, 8% of deciduous trees and 18% of mixed growth. Among the evergreens, the pine or spruce (*Fichte*) stands in the first place, forming 79% of the evergreen forests; among the deciduous woods, the European beech (*Fagus silvatica*) forming 65% of the deciduous forests.

On account of these facts, Austria will always have a great demand for hard wood for industrial purposes, and this has hitherto been covered for the most part from the Southern and Eastern part of the former Austro-Hungarian Monarchy (Croatia, Hungary and Poland). For the same reason, large imports of foreign wood will be necessary for the use of the highly developed wood working industry, especially for furniture manufacture. On the other hand domestic forestry will be able permanently to furnish great quantities of soft wood for inland consumption and for export. Logs will hardly be available for export in great quantities, since the sawmills need them to work up into semi-manufactured articles, boards etc. and the consumption of the wood working industries is very great in Austria. On the other hand, manufactures of wood can be exported in great quantities.

Further observations on the importance of the domestic wood-working industry will be found in the chapter on Austrian industry.

III. Industry.

It was pointed out at the very beginning that Austria, on account of the nature of its soil, will always have a certain deficit in agricultural products, which indeed, can be diminished to a certain extent within a moderate time but which must be made good in the long run through receipts from industrial and commercial activity. Industry and trade are therefore of greater importance, since only through their prosperous development is a healthy economic condition of Austria possible.

Supported by its natural resources Austria has brought to a high grade of development its iron industry and wood industry, as well as the industries that are connected with these, such as the electrical and paper industries. The natural gifts of its population have insured Austria a high position in the manufacture of all those articles that require taste and delicacy.

The fact that Austria was only a part of a greater economic system had as a result the fact that not all the industries settled in Austria for which there was a possibility of development. On the contrary, industrial activity scattered itself over the whole territory of Austria-Hungary, wherever the conditions of production were most favorable. The food industries had their works for the most part in the territory of the new Succession States, outside of the Republic of Austria, since the mountainous land of Austria makes it impossible to produce sufficient agricultural raw materials. In the case of other industries, local distribution is based upon the former active domestic intercourse. For example, in the textile industry the production of the Austrian cotton spinners is more than twice as large as the demand of the weaving establishments, so that a part of the Austrian yarns has to be exported to what is now a foreign country, Czechoslovakia, to be brought back from there in the form of textiles. These textiles,

worked up by the Vienna clothing industry then find their market as ready made clothing in Galicia or Hungary.

It is a disadvantage that Austria is so poor in mineral products. Only iron, magnesite, and salt, the latter in a very impure condition, can be produced in large quantities. The production of most other minerals is very much less than the domestic consumption. Above all, there is a deficiency of coal. The great waterfalls, the greatest natural resource of the Alps, which could supply a large part of this deficiency, have not yet been sufficiently utilized, because of the ease with which coal and crude oil could be obtained before the war from territories now belonging to the other Succession States, so that there was not the necessary incitement to such a great investment of capital.

The close relations which existed before the war, not only with the territories of the present Succession States, but even more with foreign countries farther removed, insured Austrian industry full employment and good markets. To this was added the fact that Vienna had always been the center of trade and, through its great banks, the financial center of the industries of the former Monarchy, so that the territory of the present Republic of Austria was economically very well off.

The sudden division of the unified economic territory brought industry and commerce into a difficult position. In the newly founded States energetic attempts were made to free themselves from the former center of business life by breaking all relations with Vienna and to make themselves commercially independent. Commerce found everywhere the greatest obstacles in the way of its activities; industry lost the possibility of obtaining coal and raw materials from the producing regions to which it had been accustomed, so that the situation of Austrian economics seemed to offer very gloomy prospects.

Although these difficulties, which were most sharply felt in the first half of 1919, have not yet been wholly overcome, still we must recognize a very real improvement in the general situation. Above all it has been shown that the attempts of the Succession States to sever the former relations with Vienna and, evading previous connections, to appear independently on the world market have not led to the desired results. This has been true especially in the domain of commerce. In the very time of the greatest

obstacles and restrictions Viennese commerce developed markedly; most of the important dealings with foreign countries still have to be handled through Vienna, and in many spheres Vienna is to-day more important than ever in this respect. But industry, too, has been able to extricate itself somewhat from its unfortunate position after the division. The lack of raw materials has disappeared on account of the changes in the world market; the coal supply, in regard to which Austria is almost entirely dependent on others, has been sensibly improved. Industry has obtained many new markets in the Western world both on account of the good quality of its products and on account of its more favorable price situation, and the old connections with the Succession States are slowly beginning to revive and even to increase although much still remains to be done in this direction.

If we examine the present situation of the most important industries we find that the textile industry is working on an average up to 50 % of its capacity; the paper industry has in part already reached its peace-time production, and so have the electrical industry and certain branches of the wood industry. The situation of the iron industry has recently been much improved through an agreement with a large German group. For a number of other industries we may estimate an employment of approximately 80 % of the peace-time activity.

If industry has not been able to reach a higher point up to this time, this is largely due to the general and critical stagnation in the world markets whose effects, however, have only been felt in a weakened form in Austria hitherto since the great depreciation of the crown in foreign markets favored exports. An important factor is the bad transportation situation, which is partly due to insufficient fuel but more to technical difficulties of operation. But the chief obstacle to production is the condition of government finance, which is to-day the most serious economic problem for Austria. For even if it becomes possible for the companies to get coal and raw materials through the renewal of their former relations abroad, they cannot contract for the large amounts needed for full operation because the uncertain money situation causes great differences in the course of exchange within a short time, and thus makes any calculation impossible.

A stabilization of the currency, and as a prerequisite to this a restoration of sound internal money conditions by restoring equilibrium in government finance, seem therefore at the present time the most necessary conditions for a healthy Austrian economy.

In the following pages the most important industries of Austria are considered singly, and for illustration establishments are mentioned, which, on account of their size and importance, count in international trade. The most important data with respect to the production of 1913 are comprised in the following tables. Here and in what follows the crown is always taken at its par value in time of peace (4.93 crowns = 1 Dollar). The prices given are those of the year 1913. (See the tables on pages 22 and 23).

1. The Iron Industry.

The iron industry is one of the most important in Austria, not only on account of the quantity and quality of its production but also on account of the fact that there are large deposits of excellent iron ore in Austria so that it is not dependent upon imports for its raw material⁴.

Iron ore. Iron ore is mined in the Alps, especially in Styria, at the Erzberg, at Eisenerz, and at Huetttenberg. These are great deposits of high grade ores, which on account of their composition are especially adapted to the production of white pig iron (open hearth pig iron) and less adapted for gray pig iron (foundry pig iron). The deposits of iron are almost entirely owned by the Alpine Montangesellschaft, Vienna. The yearly production under normal conditions amounts to about 2,000,000 *t.* and could be increased, since the most important mines in the Styrian Erzberg are worked as open cuts under very favorable conditions.

Austria is thus entirely independent of foreign lands for its supply of ore. The Czechoslovak works on the other hand are

⁴ See: Wirtschaftsstatistische Materialien, a. a. O. table 52 to 56; Dr. H. Tertsch: Erzbergbau Österreich-Ungarns, Vienna, 1919, page 40; Dr. Hans Höfer: Die Erzvorkommen in den deutschösterreichischen Alpen (158. Band der Schriften des Vereines für Sozialpolitik, München 1919, page 71); Die Volkswirtschaft der Nationalstaaten, published by the Allgemeine Depositenbank, Vienna 1921.

dependent upon imports for their iron ore, especially that which is free from phosphorus. This came in the year 1913 partly from the territory of the present Austria, but for the greater part from Sweden, whence it could be imported at the prices and currency relations that then existed.

Pig iron and rolled products: The production of pig iron amounts yearly under normal conditions to an average of 600,000 tons. It is practically all open hearth pig iron. Foundry iron is produced in the country only in small quantities and is imported in great part from Czechoslovakia, the German Empire, and England. Pig iron is produced almost exclusively by the Alpine Montangesellschaft at its works in Donawitz, Vordernberg, Eisenerz, and Hiefiau.

For the most part, the pig iron is worked up in Austria. The production of the iron works is divided under normal conditions as follows:

Ingots	550,000 tons
Bar iron, beams and rolled wire	190,000 "
Refined steel	50,000 "
Plates	70,000 "
Sheets	40,000 "
Drawn wire	60,000 "
Rails and structural iron	50,000 "

Austrian refined steel enjoys a world reputation, especially carbon or alloy steel such as is required for high class tools and certain structural parts (high speed tool steel) Austria has always been able to export these (Gebr. Böhler & Co. A. G. in Vienna; Johann E. Bleckmann in Mürzzuschlag; Ternitzer Stahl- und Eisenwerke Schöller & Co. Vienna; Steirische Gußstahlwerke A. G. in Judenburg; Rud. Schmidt & Co. in Vienna). The Poldi steel production now belongs to Czechoslovakia.

Austrian industry produces many plates and beams (Alpine Montangesellschaft in Vienna). Drawn wire and wire nails are produced especially by Felten & Guillaume, Fabrik elektrischer Kabel, Stahl- und Kupferwerke A. G. in Vienna, the St. Egydier Eisen- und Stahlindustrie-Gesellschaft in Vienna, Joh. Pengg in Thörl, Franz Werndls Nachfolger in Unterhimmel, Franz Burckhardt's Söhne in Wiener Neustadt, Adolf Finze & Co. in Kalsdorf and M. Schmidt & Söhne in Wilhelmsburg. Cold rolled steel

Iron.

Industry	Number of establishments	Number of workmen	Yearly production	Remarks
Iron ore.	2	5,000	2,000,000 tons	
Pig iron	1	13,000	600,000 tons	
Rolled products . .	26		125,000,000 crowns	
Iron manufactures	250	40,000	180,000,000 crowns	scythes . 13 mill. crowns tools . . 13 mill. crowns screws and wire manufactures. 24 mill. crowns hardware 10 mill. crowns castings. 42 mill. crowns
Machines	140	21,000	120,000,000 crowns	
Automobiles . . .	9	20,000	25,000 automobiles	
Freight cars . . .	2	4,000	5,000 cars	
Locomotives . . .	4	5,000	400 locomotives	
Bicycles	3	1,000	70,000 bicycles	

Textiles.

	Industry	Number of establishments	Number of spindles	Yearly production
Spinning Mills	Cotton.	47	1,171,000	36,000,000 <i>kg</i>
	Wool (worsted yarn) . . .	3	133,000	3,500,000 „
	„ (carded yarn)		48,000	
	Linen	1	8,500	720,000 „
	Hemp	2	13,400	6,500,000 „
	Jute	1	8,800	—
Weaving Mills			Power Looms	
	Cotton.	42	11,600	90,000,000 <i>m</i>
	Wool (carded yarn)	25	1,280	—
	Linen	19	320	350,000 <i>kg</i>
	Hemp and jute	2	385	—
Miscell.	Printing establishments. . .	13	Machines	63,000,000 <i>m</i>
	Cotton embroideries. . . .	—	1700 Schiffli-mach. 2000 hand embr.m.	—

Various Industries.

Nr.	Industry	Number of establishments	Number of workmen	Yearly production
1	Electric	35	25,000	250,000,000 crowns
2	Paper	190	14,000	<div> 120,000 tons cellulose 150,000 „ wood pulp 180,000 „ paper </div>
3	Glass	17	3,600	10,000,000 crowns
4	Chemicals ¹	70	8,000	90,000,000 crowns
5	Bricks and tiles ²	390	—	9,100,000 tons
6	Cement	19	4,000	750,000 tons
7	Rubber	5	10,000	40 to 50,000,000 crowns
8	Leather production	232	10,000	<div> 1,100,000 hides sole leather 900,000 „ upper „ </div>
9	Leather working..	219	11,000	300,000,000 crowns
10	Furniture	40 ³	15,000	16,000,000 crowns
11	Magnesite.	5	4,000	220,000 tons calcined magnesite

¹ Establishments with more than 50 workmen.

² Only annular furnace works.

³ In factories.

Provisions.

Nr.	Industry	Number of establishments	Number of workmen	Yearly production	Remarks
1	Beer	211	10,000	7,000,000 hl	10 % beer
2	Malt	2	600	17,000 tons	
3	Flour	400	2,000	1,000,000 „	70 large mills
4	Sugar	4	2,000	50,000 „	
5	Margarine	17		22,000 „	
6	Salt	6	2,600	200,000 „	
7	Tobacco	9	3,400	12,200 „	
8	Alcohol	26	2,500	134,000 hl	

is produced by the Maschinenfabriks-Aktiengesellschaft N. Heid in Stockerau; Josef Wertich sel. Wwe. G. m. b. H. in Waidhofen, Felten & Guillaume in Vienna and Brüder Lapp in Rottenmann.

For the production of sheets the following are important: Joh. E. Bleckmann in Mürzzuschlag; C. T. Petzold & Cie. in Krieglach; Brüder Lapp in Rottenmann; Blech- und Eisenwerke "Styria" in Wasendorf; Vogel & Noot in Wartberg.

Rails are produced in Austria by two works: Alpine Montangesellschaft und Walzwerk Graz der Südbahnwerke Wien-Graz, while two others: Prager Eisenindustrie-Gesellschaft and Witkowitz Bergbau- und Eisenhüttengewerkschaft are in Czechoslovakia. The Trzyniec iron works of the Oesterr. Berg- und Hüttenwerks-Gesellschaft lie in Polish territory. The entire production of the Austrian works, as above stated, amounted to 50,000 tons, while the entire production of Old Austria, on the average of the years 1913:1915, was 100,000 tons.

Under normal conditions refined steel, rails, plates, beams and wire are available for export.

The following is a summary of the production of Old Austria in the year 1913, giving the division among the territories of the different Succession States:

States:	Open hearth pig iron:	Foundry pig iron:	Total pig iron:
	tons in round figures:		
Austria	580,000	25,000	605,000
Czechoslovakia	650,000	220,000	870,000
Poland	150,000	20,000	170,000
Trieste (Servola)	105,000	5,000	110,000
Total . . .	1,485,000	270,000	1,755,000

The greater share of Czechoslovakia arises out of the fact that the iron manufacturing centers of Kladno and Koenigshof (Prager Eisen-Industrie-Gesellschaft), Witkowitz (Witkowitz Bergbau- und Eisenhüttengewerkschaft) and Trzyniec (Oesterreichische Berg- und Hüttenwerksgesellschaft) are in its territory.

Iron working industries. Resting upon a long and distinguished history and the possibility of procuring the necessary raw materials within the country, the iron working industry of Austria

has been especially well developed. It will have a great future especially with its progress toward manufacturing on a large scale. It has the greatest importance in export trade, since its products appear to be capable of competing in all countries, and it has at its disposal, especially in the East, excellent sales organizations.

The number of the larger establishments may be estimated at 250; the number of workmen was before the war 30,000 to 40,000, the value of the total production was then about 160 to 180 million crowns. This sum included scythes 13,000,000 crowns; tools 13,000,000 crowns; screws and wire manufactures 24,000,000 crowns; building hardware 10,000,000 crowns, castings 42,000,000 crowns. At present on account of the many difficulties in obtaining raw materials and in transportation, and also on account of the recent reduction in the working hours and in work accomplished, production has sunk to about 60% on an average.

The value of the product, on the other hand, on account of the rise of prices in depreciated crowns, is many times that of the year 1913. A complete statement of the sources of the numerous articles produced by the iron working industry with the names of all the greater firms has been published by the association of the Austrian Machine Industry in Vienna (*Verband der österreichischen Maschinenindustrie in Wien*) under the title: "Bezugsquellenverzeichnis über die Erzeugnisse der Eisen- und Metallindustrie Österreichs". In addition to the firms that are named on preceding pages of this work, which have an important position also in iron working, a few other firms, with their specialties, are the following: Vogel & Nooth in Wartberg (forgings, ploughshares and tools); Schrauben- und Schmiedewarenfabriks-Aktiengesellschaft Brevillier & Co. and Urban & Söhne in Vienna (screws and forgings), Kärntnerische Eisen- und Stahlindustrie-Gesellschaft in Vienna (drawn wire); Fischersehe Weicheisen- und Stahlgießerei-Aktiengesellschaft in Traisen (electric steel articles and castings); St. Pöltener Weicheisen- und Stahlgießerei Leopold Gasser in St. Pölten (electric castings); Steyrische Gußstahlwerke-Aktiengesellschaft in Vienna (springs, automobile material, cast steel, and special steels); Franz Wernlds Nachfolger in Steyr (forging and rolled wire); Eisenwerke Friedrich Neumann in Marktl (bar iron and galvanized iron); Stey-

rische Sensenwerke-Aktiengesellschaft in Graz (scythes); Sensenwerke Simon Redtenbachers Wwe. & Sohn in Linz (scythes, sickles, and cutlery); Brüder Wüster Walzwerke in Ybbs (spring steel, umbrella frames, and saws); F. Burkhardts Söhne in Wiener Neustadt (wire work); Nierhaus'sche Hammerwerke in Mürz-zuschlag (clamps, shovels and anvils); Eisenwarenfabriks-A. G. in Sopron-Graz (hardware and iron work); Gebrüder Gründmann in Herzogenburg (furniture locks); Gebr. Busatis in Purgstall (saws); Josef Haiser in Kienberg (axles), M. Schmidt & Söhne in Wilhelmsburg (thills, wagon axles, supplies for spur manufacturers); Wertheim-Aktiengesellschaft in Vienna (iron safes); Josef und Leopold Quittner A. G. in Vienna (iron furniture); Hutter & Schrantz A. G. in Vienna (wire netting).

Machines. For the construction of machines in general we need consider among the fragments of the former Austria only the Republic of Austria and Czechoslovakia. Austria proper has a considerable number of very productive concerns, some of which we give in the following list, mentioning their specialties. The whole number of the larger concerns is 110. The more important firms are the following: Grazer Waggon- und Maschinenfabriks-Aktiengesellschaft, vormal's Johann Weitzer in Graz (freight cars and machines); Paukerwerke Maschinenfabriks-Aktiengesellschaft N. Heid in Stockerau (machines); Maschinen- und Waggonfabriks-Aktiengesellschaft Simmering in Vienna (machines and railway cars); Leobersdorfer Maschinenfabriks-Aktiengesellschaft in Vienna (machines); Ernst Krause & Co. in Vienna (machines tools); Vulkan Maschinenfabriks-Aktiengesellschaft in Vienna (machines); A. G. R. Ph. Waagner, L. & J. Biro and A. Kurz, Brückenbauanstalten in Vienna (bridge building); Teudloff & Dittrich in Vienna (pipe fittings); C. Schember & Söhne, Aktiengesellschaft in Atzgersdorf near Vienna (wagons); Garvenswerke in Vienna (pumps); J. H. Voith in St. Pölten (water turbines); A. G. für Tiefbohrtechnik und Maschinenbau, vormal's Trautzel & Co. in Vienna (machines and equipment for deep drilling); Schnellpressenfabrik Mödling, vormal's L. Kaisers Söhne in Mödling (rapid printing presses); Lohnerwerke G. m. b. H. Flugzeug- und Fahrzeugbau in Vienna (aeroplanes and vehicles).

For agricultural machines the greatest factory is that of the Hofherr-Schrantz-Clayton-Shuttleworth A. G. in Vienna.

For the rest, we may refer to the abovementioned "Bezugsquellenverzeichnis des Verbandes der Österreichischen Maschinenindustrie" which will give further particulars of the production.

Locomotives. The seven factories of Old Austria that manufacture locomotives are so distributed that four of them remain in Austria: Aktiengesellschaft der Lokomotivfabrik vormals G. Sigl in Wiener-Neustadt; Wiener Lokomotivfabriks-A. G. in Vienna-Floridsdorf; J. Krauss & Co. in Linz; and the Maschinenfabrik der Staatseisenbahngesellschaft in Vienna, while three are in Czechoslovakia.

The Austrian locomotive factories, with a yearly capacity of 400 locomotives, are now employed for the most part for export. The invested capital is estimated at 16,000,000 crowns according to the value in 1913.

The total capacity of the factories in Old Austria was 600 locomotives yearly.

Railway cars. Austria is represented by two car factories: Maschinen- und Waggonfabriks-A. G. Simmering in Vienna and Grazer Waggon- und Maschinenfabriks-A. G., vormals Johann Weitzer in Graz. Four factories lie in Czechoslovak territory; Nesselsdorfer Waggonfabriks-A. G., Brünn-Königsfelder Maschinenfabrik, which belongs to the Österreichische Maschinen- & Waggonfabriks-A. G. in Simmering; Staudinger Waggonfabrik, and the Ringhofer Works in Prague.

The capacity of the Austrian factories amounts to 5000 cars per year, but, on account of the difficulties, the production in 1919 was less than half of that number.

Narrow gauge field railways. The small motor railways that are important for agriculture and forestry are manufactured in Austria by the Österreichische Daimler Motoren A. G. in Wiener-Neustadt and the Puch-Werke-A. G. in Graz.

Automobiles. The automobile industry remains preponderantly Austrian, since 9 of the factories of Old Austria are on Austrian territory, namely, the following: Österreichische Daimler Motoren-A. G. in Wiener-Neustadt; Puchwerke-A. G. in Graz, Österr. Waffenfabriks-Ges. A. G. in Vienna; Wr. Automobilfabrik-A. G., vormals Gräf & Stift, Vienna; Österreichische Fiat-Werke-A. G. in Vienna; Österreichische Saurerwerke in Vienna; A. Fross-Büssing, Spezialfabrik für Nutzauto, System Büssing in Vienna;

Motorlastwagen- und Motorenfabrik Ing. G. R. Perl in Liesing; W. A. T., Wiener Automobilfabriks G. m. b. H. in Vienna. Only three automobile factories are on Czechoslovak territory: Erste böhmisch-mährische Maschinenfabrik in Prague; Laurin & Klement A. G. in Jungbunzlau; Nesselsdorfer Waggonbaufabriks-Ges. in Nesselsdorf.

These plants have been greatly enlarged in recent years, and their capacity is now five times what it was before the war. The necessary semi-manufactures can almost all be produced in Austria, and in the matter of equipment Austria can also make itself gradually independent of foreign countries. The Austrian automobile industry requires export markets, since the total capacity exceeds the home need.

Motor cycles and bicycles. Austria has first class factories of motoreycles and bicycles, the Vereinigte Styria- and Dürrkopp-Werke-A. G. in Graz; Waffenfabriks-A. G. in Steyr and Puchwerke-A. G. in Graz.

Shipyards. The shipyards of Old Austria on the Adriatic went to Italy. On the Austrian reaches of the Danube lie the shipyards of the Donau-Dampfschiffahrtsgesellschaft in Korneuburg, and those of the Austriawerke-A. G. in Linz.

2. Textiles.

The following table gives in figures a picture of the present development of the textile industry in Austria⁵.

	Number of spindles	Power looms
Cotton	1,171,000	11,616
Wool (worsted yarn)	133,000	
Wool (carded yarn)	48,000	1,280
Linen	8,500	320
Hemp	13,400	
Jute	8,800	385

⁵ See Wirtschaftsstatistische Materialien, a. a. O. tables 37 to 48; Karl Janowsky: Die Textilindustrie in der Tschechoslovakei und in Deutschösterreich, Wien 1920; Jahrbuch des Vereines der Baumwollspinner Österreichs-Vienna 1917; Die Volkswirtschaft der Nationalstaaten, published by the Allgemeine Depositenbank, Vienna 1921; Wirtschaftsgeographische Abhandlungen zur Wirtschaftskunde der Länder der ehemaligen österr.-ungar. Monarchie, published by Dr. Franz Heiderich, Vienna, 1919, Heft 14, 15, 16.

The spinning industry in the different branches of textiles is much better developed than weaving. Thus the cotton spinning establishments, with their 1,200,000 spindles when working at full capacity, can keep about 30,000 looms busy, while there are actually only about 12,000 looms in Austria so that two thirds of the production of the Austrian spinning mills must be exported for further improvement in foreign countries. In normal times the best market was found in Hungary and Moravia because of favorable freight rates. The Austrian cotton weaving establishments are however not able to supply the domestic need, for, according to the average statistics of production and consumption in the old Austro-Hungarian territory, 18,000 looms would be needed to cover the domestic consumption, that is, 50% more than now exist. The spinning industry is accordingly a great exporting industry, while the weaving industry appears to have a considerable chance for development. The branches that carry the manufacture further, printing, bleaching, coloring, and finishing, are on the other hand well developed and need for full employment to import textiles in a crude state. The clothing industry is also dependent on imports for its raw material, but most of its products are exported.

In the wool industry, which like the cotton industry, must procure almost all of its raw material from foreign lands, the worsted spinning mills have 133,000 spindles, but there is in the country no great weaving establishment, except some efficient factories of blankets, carpets, and furniture upholsterings. In Carinthia and the Tyrol there are several medium sized establishments that produce a woollen stuff known as "Loden".

The hemp spinning mills in normal times had to export 80% of their production.

In the linen industry, the spinning mills worked before the war for export. The need of coarse linen goods was at that time covered by domestic products, but fine linen had to be brought almost wholly from the regions that now belong to Czechoslovakia.

In general, Austria must come second to Czechoslovakia in its textile industry since the best labor conditions and raw material supply have always been in Bohemia and Moravia, and now through the acquisition of Slovakia other large textile factories have come into the Czechoslovakian State. If we con-

sider the most important branch, the cotton spinning industry, we find that only about 20% of the productive capacity of the former Austro-Hungarian Monarchy has remained in Austria, and about 10% of the cotton weaving industry.

But through the old economic relations, and most of all through the connection of the Czechoslovak textile enterprises with the great Vienna banks, Vienna has retained a great influence over the Bohemian textile industry. The special importance of Vienna lies in the fact that it has always been the mart for all the textile products of Austria-Hungary and that it is the intermediate station for the special trade with the Orient. Finally it is the chief seat of the highly developed clothing manufacture, and has always had a marke for its finer products everywhere, and for its mass production especially in the Orient. Vienna therefore still deserves the greatest attention of those foreign countries which take an interest in business with Eastern Europe, since it is the center of the intermediate trade with the East, which requires special methods of business with which the Western European and American firms are not acquainted, and it also deserves interest as the seat of a highly developed clothing manufacture.

The textile industry is almost wholly dependent upon importation for its raw materials. The yearly requirement may be estimated as follows:

45,000,000	kg	cotton
12,000,000	"	wool
5,000,000	"	hemp
1,500,000	"	flax
10,000,000	"	jute.

These figures give the requirements as of the last years of peace, and on the assumption of full employment. At present the textile industry is 40 to 50% employed. Since the war the mills, especially in the cotton industry, have been employed to an ever increasing extent in what is known as commission work (Lohnarbeit) for foreigners, and this kind of employment might easily be extended still further.

In what follows, exact data will be given of the several branches of the textile industry, with relation to operation and production, and the largest Austrian concerns will be enumerated.

a) Cotton.

Austria has two centers of cotton spinning; one in the Vienna basin (Pottendorf, Rohrbach near Neunkirchen, etc.) and the other in the Rhine valley (Dornbirn, Feldkirch, etc.). Of the whole number of spindles which is 1,171,000 40% are in Lower Austria, and 30% in Vorarlberg.

The raw materials needed yearly by the cotton spinning mills before the war amounted to about 45,000,000 kilograms.

The production of the last year before the war in the different branches of the cotton industry was as follows:

Cotton spinning	36	mill. kilograms
Cotton weaving	90	" meters
Embroidery and knitting	1 1/2	" kilos of material
Cotton printing	63	" meters

The capital invested in spinning mills may be put at 93,000,000 crowns and in weaving mills at 14,000,000 crowns according to values in time of peace.

The most important undertakings are the following: Vereinigte österreichische Textilindustrie A. G. Vienna (textiles); A. G. der Kleinmünchener Baumwollspinnereien und mechanischen Webereien Vienna (cotton spinning and power weaving); A. G. der Baumwollspinnerei in Theresienthal and Münchendorf, Vienna (cotton spinning); A. G. der Baumwollspinnereien, Webereien, Bleiche, Appretur, Färberei und Druckerei zu Trumau und Marienthal Vienna (cotton spinning, weaving, bleaching, dressing, dyeing and printing); Harlander Baumwollspinnerei und Zwirnfabrik A. G. Vienna (cotton spinning and thread factory); F. M. Haemmerle, Dornbirn, Vorarlberg; Getzner, Mutter & Co., Bludenz, Vorarlberg; Carl Ganahl & Co, Feldkirch, Vorarlberg; Gebrüder Enderlin, Druckfabrik und mechanische Weberei A. G. Vienna (printing and power weaving); Neunkirchner Druckfabriks A. G. Vienna (printing); Guntramsdorfer Druckfabriks-A. G. Vienna; Vereinigte Färbereien A. G. Vienna (dyeing); Schüller & Co. A. G. Vienna; Spitzenindustrie A. G. Vienna (laces); Erlacher Textilindustrie A. G. Vienna (textiles).

The following table shows the means of production and the material used in the Austrian cotton industry before the outbreak of the war.

The Austrian Cotton Industry in the Year 1913.⁶

Branch	Number of works	Total number of workmen	HP	Number of machines	Kind of machines	Material used in tons (1913)
1. Opening	2	380	1,919	177	Lickers in and thread waste openers	—
2. Fine spinning .	47	9,896	30,836	1,171	Fine spindles (in thousands)	43,489
3. Waste and Vi- cuna spinning .	2	149	326	13	Carding machines	387
4. Cleaning waste manufacture . .	4	122	265	26	Lickers in and willows	3,400
5. Cotton batting manufacture . .	9	194	243	54	Teazeling machines	897
6. Threadmanufac- ture	27	1,507	4,238	144	Thread spindles (in thousands)	5,216
7. Weaving	42	6,537	4,518	11,616	Looms with 13 494 _m breadth	11,411
8. Ribbon weaving	23	1,248	391	—	—	626
9. Tulle curtains & lacemanufacture	6	723	295	—	—	426
10. Bands, straps and cords.	10	602	301	—	—	222
11. Frame knitting and knitting . .	24	1,707	714	2,607	Frame-knitting and knitting machines	1,466
12. Bleaching, dye- ing and dressing	56	4,349	4,908	—	—	22,687
13. Printing.	13	2,227	2,889	57	Roller printing presses	63 Mill. <i>m</i>
Total . .	265	29,641	51,843	—	—	—

⁶ See Jahrbuch, I. c., page 166.

b) Wool Industry

Number of plants:

3 worsted yarn mills
8 blanket mills
10 cloth and "Loden" mills
3 felt factories
2 factories of felt for paper machines
2 carpet factories.

Machines:

133,000 worsted yarn spindles
48,000 carded yarn spindles
1,280 carded yarn looms.

Number of workmen:

9,000 (of which about 3,000 are in the worsted yarn mills)

Production:

35,000 *q* worsted yarn
15,000 *q* blankets
15,000 *q* cloth and "Loden"
2,600 *q* felt for paper machines.

Invested capital:

about 20,000,000 crowns, peace value, in worsted yarn spinning
about 20,000,000 crowns, peace value, in the cloth and blanket mills

The import requirement of wool may be put at about 12,000,000 kilograms a year, $\frac{2}{3}$ of which was covered by Australian merino wool, and about $\frac{1}{3}$ by La Plata, merino, and Crossbred wool. The material for worsted yarn came from Germany, France and England.

The most important concerns are: Aktiengesellschaft der Vöslauer Kammgarnfabrik, Vöslau near Vienna (worsted yarn factory); Geyer & Co., Weitenegg (spinning and knitting); Adolf Duschnitz, Vienna (felt); Franz Baur's Söhne G. m. b. H., Innsbruck (Loden); Gebrüder Moro, Vietring, Carinthia (Loden); Ebreichsdorfer Filzhutfabrik S. & J. Fränkl A. G., Vienna (felt hats); Hutter & Schrantz A. G. Siebwaren- und Filztuchfabriken (sieve stuff and felt cloth); A. G. der österreichischen Fezfabriken (felt for paper machines); Philipp Haas & Söhne A. G., Vienna (carpets and upholsterings); Johann Backhausen & Söhne, Vienna (carpets and upholsterings).

c) Linen Industry.

	Spinning mills	Weaving mills
Number of plants	1	19 small establishments
Machines	8,563 spindles	320 power looms 463 hand looms
Number of workmen	638	1367
Production	18,000 hanks linen yarn	3,500 q textiles
Invested capital (peace value)	4,000,000 crowns	500,000 crowns (for 320 power looms)

The import requirement of flax per year is 1500 tons. In the spinning industry, there is only one large establishment, the Lambacher Flachsspinnerei A. G. in Linz.

d) Hemp Industry.

	Spinning mills	Power cordage works
Number of establishments	2	10
Number of spindles	13,421	—
Number of workmen	1400	250
Production	65,000 q yarns, twine, cord	1900 q cordage
Invested capital (peace value)	7,000,000 crowns	300,000 crowns

The import requirement of hemp amounts to 5000 tons yearly. The largest concerns are Lieser & Duschnitz in Pöchlarn and the Pielachberger Hanfspinnerei und Bindfadenfabriks A. G. in Vienna (hemp spinning and twine factory).

e) Jute Industry.

Number of plants	2
Number of spindles	8,800
Looms	385
Number of workmen	1600
Power	2230 HP
Invested capital (peace value)	7,000,000 crowns

Before the war the yearly requirement of raw jute for the Austrian industry amounted to about 100,000 tons.

Production exceeds the domestic demand and must export considerable quantities.

The greatest concern is the Hanf, Jute und Textilindustrie A. G. in Vienna.

f) Clothing Manufacture.

The manufacture of clothing which in all great countries is carried on in the chief cities, because, based as it is upon a constant increase of local consumption, it can thence most easily find a market for its products in the province and in foreign countries, and because at the center of traffic it can conform to the latest requirements of fashion, in Austria-Hungary too has its seat in Vienna. This industry has received a great impetus in recent years and could today under normal conditions employ thousands of workmen. Before the war, the consumption of ready made clothing in the whole Austro-Hungarian territory was supplied by Vienna, except for the much smaller production in Prossnitz. Besides this, a great deal was exported to the Balkans and to the near East where the greater houses had branches everywhere.

The Austrian clothing industry will certainly retain this market, especially in the Succession States, even though diminished, since a new clothing industry in such small countries cannot arise quickly. In view of the fact that the weaving industry, as we have mentioned at the beginning of the chapter, is not sufficiently developed in Austria, the clothing industry must obtain its stuffs for the most part from foreign lands and could render excellent service as a finishing industry for West European and American concerns, in their business with the Succession States and the Balkans. The largest concerns which give out home work are, for men's clothing, Victor Tiring & Brüder, Vienna, S. Stein G. m. b. H., Vienna, and, for women's clothing, Freudenthal & Bachwitz, Vienna. The most important firms which operate with machinery and produce uniforms also on a large scale are M. Neumann Söhne & Co., Vienna, Ludwig Bukowitz & Söhne, Vienna, and Arthur Roth, Vienna.

Besides the industrial mass production, which directs itself especially to the East, the Vienna model makers have always worked on a great scale for the West, especially for Germany and England, and have shown themselves quite capable of competing in these markets. During the war Holland and the Scandinavian countries have come to the fore. The manufacture of furs has a special importance. Before the war it had close

relations with Paris. As makers of models may be mentioned among many others the Vienna firms of Ludwig Zwieback & Bruder, Köllner & Weigner, E. Grünwald, and, as manufacturers of furs, the Vereinigte Pelzindustriengesellschaft and Penizek & Rainer.

Apart from clothing manufacture proper, there is in Vienna also an efficient manufacture of lingerie to which belong the great factories for machine made underwear, as for example, Leopold Landeis, A. G. Vienna, and S. Laufer, Vienna.

3. Wood Industry.

The great forests, of which we have spoken in the chapter on agriculture and forestry, have enabled the wood working industry to be so well developed, and to be today among the most important industries of Austria.

The *sawing industry*, with 257 steam saw mills and 5196 water power saw mills, is able to work up the whole timber production of Austria and to provide for considerable quantities of lumber for export. With reference to the quality of the wood, it is mostly such as is suited not only to building purposes but also to the construction of furniture and other articles, especially those that are produced in great quantities. Besides this, mechanical pulp and mine supports are exported.

Railway ties of larch, pine, and red beach, and recently, in increasing quantities, telegraph poles are exported in all directions. The provinces of Salzburg, Styria and Carinthia are the most important in their production.

The *furniture industry*, one of the indigenous and most highly developed industries of Austria employs in about 40 factories some 4,000 workmen and in small establishments about 10,000 workmen. It has its chief seat in Vienna, especially in the production of high class furniture. The manufacture of cheap furniture, which has recently gained especial importance in export, is carried on in Vienna and in the provinces. On account of the good taste shown in the manufacture of fine furniture and on account of the low price of soft wood furniture made possible by the abundant supply of raw material, the Austrian furniture industry is capable of competing in every way with foreign countries. Its chief market was formerly in the terri-

toñies of the Succession States and in the Balkans, but recently it is found in increasing measure in the West and especially in Italy. Among the larger firms may be named:

For fine furniture: Botho & Ehrmann, Vienna V; Sigmund Jaray, Vienna IV; Julius & Josef Hermann, Vienna VII; J. W. Müller, Vienna V; Portois & Fix, Vienna III; Friedr. Otto Schmidt, Vienna IX; August Ungethüm, Vienna V.

For soft wood export furniture, besides the above named firms: D. Druckers Dampfsägewerk und Holzwarenfabrik, Vienna I; L. & R. Höfler, Ges. m. b. H., Mödling.

For office furniture: Wilhelm Fehlinger & Söhne, Vienna IV; "Beg" Büroeinrichtungen G. m. b. H., Vienna VII.

The *veneering industry* is able to work for export on a great scale, but since Austria for the most part possesses only soft wood forests, it is largely dependent upon a regular supply of hard wood from the Succession States, especially Jugoslavia, and upon the possibility of supplies of foreign woods. The present difficulties of transportation have on that account necessarily led to a great limitation of this industry. The most important firms are: Ignaz Großmann sen., Vienna XII; Lourie & Co., Vienna X, and Klosterneuburger Holzindustriengesellschaft, Klosterneuburg.

Building carpentry, especially in recent years, has taken a very great leap and is capable of competition everywhere in window and door frames and also in whole constructions such as barracks, warehouses, sheds, hangars, knockdown or portable houses and all standardized structural parts. The two largest firms are: L. & R. Höfler, Ges. m. b. H., Mödling, and J. W. Müller, Vienna V.

Large *box factories* which could export are: M. Koffmahn & Söhne, Atzgersdorf, for box parts and ready made containers of every kind; Vereinigte Holz- und Industrie-A. G. for box parts; Lourie & Co., Vienna X, for cigarette boxes and fine boxes (Kassetten).

The *cooperage industry* has exported wine and beer casks to the Succession States and to France and Germany. The greatest firms in this branch are: F. A. Dreibholz, Wiener mechanische Faßfabriks-A. G., Vienna XII, and Mechanische Faßfabrik Vienna-Atzgersdorf Johann Drexler & Sohn, Atzgersdorf.

The wood and lumber trade has a very special importance for Austria with respect to international commerce. Vienna has

ever been the center of this trade for the whole Austro-Hungarian Monarchy with its great forests, especially in Croatia and Slavonia (oak, elm, beech) Hungary, Galicia, and Bukowina (oak, beech and evergreens). By the division of the Monarchy great difficulties have arisen in trading with these regions, but the firms that were already known internationally have still preserved their importance and Vienna has thereby retained its leading position in the lumber business of those regions. Vienna firms that should be mentioned with respect to international trade and whose business extends throughout the territory of the former Austro-Hungarian Monarchy, are the following: Eisler & Brüder; Beyersdorf & Biach; Holzhandels-A. G.; A. G. für Holzverwertung; Eisler & Ortlieb and P. C. Goetz & Co., A. G.

4. Paper Industry.

The paper industry, which played an important role as an export industry in the former Austro-Hungarian Monarchy, has a still greater importance for the Republic of Austria, since almost $\frac{2}{3}$ of the factories of Old Austria are within the present country. The consumption of the present Austria is of course materially less than that of Austria-Hungary, and quite important quantities of paper can be exported in a crude or manufactured state.

The principal raw material of the paper industry, wood, is found in the country in sufficient quantities, so that the question of providing raw materials from foreign lands does not enter here. Great difficulties in production arose only in the time immediately following the war through lack of coal, for wood cannot satisfactorily replace coal as a fuel.

The production of the Austrian industry, at full capacity, is: semi-manufactures: 120,000 tons cellulose and 150,000 tons mechanical pulp and pasteboard: finished goods 180,000 tons paper, including 29,000 tons wrapping paper, 1600 tons tissue and cigarette paper 47,000 tons rotation paper (print paper on rolls) and 100,000 tons other paper.

More than half of this amount is available for export. Before the war the paper was sent in all directions especially to England, Western Europe, North and South America. In Egypt and

India, the Austrian paper industry has for a long time taken a leading place. The names of the greater manufacturers are known throughout the world and the Austrian factories now have good possible markets in these fields.

The Austrian industry is also especially efficient in the production of all the finer writing papers, drafting papers, and colored papers, in the manufacture therefrom of various paper articles (Papier-konfektionswaren) and also in lithography, photography and copper engraving, that are connected with the paper industry. The value of the production of these industries amounted in the year 1914, at the prices of that time to 140,000,000 crowns, and may naturally be taken to-day at many times that sum. In these products Austria has always been fully capable of competing in all Western European markets, on account of the good taste shown in their manufacture.

With regard to the organization of the industry, most of the factories are united in several great concerns which combine the production of the semi-manufactured articles and of the finished goods. To these belong the Neusiedler Konzern (Neusiedler A. G. für Papierfabrikation, Wien); the Leykam-Josefsthaler concern (Leykam-Josefsthal A. G. für Papier- und Druckindustrie, Vienna); the Elbemühl concern (Elbemühlfabrik und Verlags A. G. Vienna) and the Mürztaler concern, which united several factories in a common representation of their interests, without interfering in their independent management. The leader of this last named concern is the Mürztal Holzstoff- und Papier-Fabrik Aktiengesellschaft. Further the Steyrmühl-Papierfabrik und Verlags-A. G. in Vienna should be named. The largest factory that produces cellulose is the Kellner Partington Paper Pulp Company Ltd. in Hallein. The importance of these concerns is the greater because they not only operate in Austria but also control most of the production in the territory of the Succession States so that the paper production of the former Austria is still almost wholly managed from Vienna. There is an especially active barter trade with the Czechoslovakian factories; cellulose is sent to Austria from Czechoslovakia, while Austria exports mechanical pulp to Czechoslovakia.

A number of concerns of different size are engaged in the manufacture of paper goods, 180 factories in the manufacture of

paper articles and 174 in making paper boxes. They are united in the Association of Manufacturers of Paper and Cardboard (Wirtschaftsverband der Papier- und Pappwaren-Erzeuger in Vienna VI.) Among the larger concerns are:

Manufactures of Paper: D. R. Pollak & Söhne, Vienna VII; Theyer & Hardtmuth, Vienna, I; Westermann, Seeburg & Co., Graz; A. Segal & Co., Vienna XV; I. österreichische Spielkartenfabrik A. G. Piatnik & Söhne, Vienna XIII; Löwit & Co., Kartonnagenfabrik, Vienna XVII; A. Glücksmann, Kartonnagenfabrik, Vienna XVII.

Account books: F. Rollinger, Vienna XII; R. Strelez, Vienna III; Geschäftsbücherfabrik A. G. vorm. J. C. König & Ebhardt, Vienna IV.

Cigarette paper: Adolf & Alexander Jacobi, Vienna VIII; Jac. Schnabel & Co., Vienna XIX; Abadie, Vienna X; Adolf Reiss, Vienna X.

Austrian Book Publishing Trade and Printing Industry: Besides the study of science it is interested in the publication of belles lettres and art works and especially of music. Taking account of present conditions it has also included in its activities the publication of original works in foreign languages. The printing industry is united in the Association of Book Printers (Wirtschaftsverband der Buchdrucker) in Vienna I. As important concerns in this branch there should be named: Gesellschaft für graphische Industrie (Graphic Art Company), Vienna VI; Österreichische Staatsdruckerei, Vienna, III (Government printing office); Buchdruckerei der Manzschen Verlags- und Universitätsbuchhandlung, Vienna IX; Waldheim, Eberle, A. G. Vienna VII; Christoph Reißers Söhne, Buchdruckerei, Lithographie und Steindruckerei, Vienna V; Johann Vernay, Druckerei- und Verlags-A. G. Vienna IX; Karl Scheibe, Buchbinderei, Vienna VI.

5. Electrical Industry.

Most of the concerns that manufactured electrical goods in the Austro-Hungarian territory, are situated in Austria. Czechoslovakia cannot now nor in the near future supply its needs by its own production: Jugoslavia, Poland and Roumania have at present no electrical industry at all. These countries are still

for the most part supplied by the present Austrian manufacturers. There was also formerly a lively export to the Balkans, where the Austrian firms maintain sales organizations, reaching the smallest places, and where they have the necessary acquaintance with places and persons, so that they may be expected to find a sure market in those regions also in the near future. Through the division of its former territory, the Austrian electrical industry will be in the future mainly an export industry. At present the factories, whose activity had been throttled during the war, are very busy with the rebuilding of domestic industry, but in the future the domestic demand will probably require scarcely more than 30% of their capacity, while 70% will be available for export.

In the following table there is given a summary statement of the different branches according to the situation in 1913:

	Estimated approximate value of plants in currency at par in crowns	HP	Number of workmen when operated at full capacity
High voltages (Electrical machines)	40,000,000	3,500	12,000
Low voltages (Telephone and telegraph apparatus)	15,000,000	1,000	6,000
Incandescent lamps	8,000,000	1,200	5,000
Cables	25,000,000	1,500	2,800

The basis of the estimates is the crown at its peace time value, that is, 1 Dollar equal to 4.93 crowns. At full capacity the industry can employ about 25,000 workmen. During the war the factories considerably enlarged their plants. The whole output of the old Austrian electrical industry in the year 1913 amounted in round figures to 250 million crowns, most of which belongs to Austria since few factories of the former Austria lie in Czechoslovak territory.

These output figures give, it is true, only an imperfect picture of the importance of the great electrical factories, since those that manufacture high voltage apparatus do not limit themselves to factory production, but often as engineering companies plan whole water power plants, electric works, etc. and then as contractors carry out all the construction. For this they produce in their own factories only the electric apparatus, while the

other machinery is furnished and the building done by firms in those lines. A great field of employment for all branches of the electric industry will be provided in the very near future by the development of the water power in the Alps.

Of the necessary raw materials only a part can be provided by the domestic iron industry, and the factories must remain dependent upon foreign countries for supplies of rubber, copper, textiles, and porcelain. Nevertheless the cost of securing these raw materials is fully covered by the finished products, which are then in great part reexported, so that this industry is to be regarded as one of those in which the exports most largely exceed the imports.

In Vienna is found the Association of the Electrical Industry of Austria (Verband der Elektrizitäts-Industrie Österreichs), in which all the manufacturers have an organization to represent them in questions relating to their branch. In the following list, the largest Austrian concerns, all of them situated in Vienna, are named:

High voltage industry (factories of dynamos, motors, transformers, apparatus; meters, and other electrical installation material): A. E. G. Union Elektrizitätsgesellschaft; Österreichische Siemens-Schuckert-Werke A. G.; Österreichische Brown Boverie Werke A. G.; Gesellschaft für elektrische Industrie A. G.

Low voltage industry (telephone, telegraph, signal apparatus, railway safety apparatus, etc.): Siemens & Halske A. G.; "Ericson" Österreichische Elektrizitäts-Aktiengesellschaft vormals Deckert & Homolka; Kapsch & Söhne, Telephon- und Telegraphenfabrik Aktiengesellschaft; Vereinigte Telephon- und Telegraphenfabriks Aktiengesellschaft Czeija, Nissl & Co.; Telephonfabrik Aktiengesellschaft, vormals J. Berliner.

Accumulator factories. Akkumulatorenfabrik Aktiengesellschaft.

Cable factories (for the manufacture of all kinds of insulated electric wiring) Felten & Guillaume, Fabrik elektrischer Kabel, Stahl- und Kupferwerke A. G.; Kabelfabriks- und Drahtindustrie A. G.; Österreichische Siemens-Schuckert-Werke Aktiengesellschaft, Kabelfabrik.

Incandescent Lamp factories: Westinghouse Metallfaden-Glühlampenfabrik G. m. b. H.; Watt Elektrische Glühlampenfabrik Aktiengesellschaft; Johann Kremenezky.

6. Rubber Industry.

The manipulation of crude rubber and the production of rubber goods is carried on in Austria by the following 5 concerns: „Semperit“ Österreichisch-amerikanische Gummiwerke Aktien-gesellschaft, Wien; Asbest- und Gummiwerke Calmon G. m. b. H. Wien Stadlau; Vereinigte Gummiwarenfabriken Harburg-Wien. vorm. Menier—J. N. Reithoffer, Vienna; Josef Reithoffers Söhne. Garsten near Steyr; Josefsthaller Gummi- und Asbestwaren-Fabrik G. m. b. H., Josefthal.

These five concerns employed in the year 1913 about 10,000 workmen and used crude rubber to the amount of 1.3 million kilograms. The raw material was at that time procured entirely by way of London, Liverpool, and Antwerp. Recently New York has come more and more to the fore as a source of supply.

The Rubber Industry is almost exclusively an export industry, since $\frac{4}{5}$ of its production goes to foreign countries, that is, to the Succession States, the Balkans, Italy, Switzerland, and Holland.

The total output amounted in the year 1913 to about 41,000,000 crowns. The existing factories were much enlarged during the war by reason of the increased demand and the protection from foreign competition so that production could be increased to many times the 1913 amount, if the plants were operated to capacity, which has not yet been attained. The production of bicycle tires, automobile tires, and inner tubes and „lt-plates“ (packing) has especially increased.

The technical rubber goods, whose production in the year 1913 amounted to about 11,000,000 crowns, go for the most part to the Succession States; tires and overshoes to the Succession States, the Balkans, Italy, Holland, and England. For toy balls the „Semperit“ A. G. in Vienna, has the largest factory on the continent, and carries on an extensive export business, chiefly to England, America, Switzerland, and Holland.

A summary view of the production in the year 1913, according to the prices at that time, is given in the following table:

	Crowns
a) technical goods	10,587,810 —
b) „Patentplatten“ (packing)	115,357 —
c) shoes	1,968,307 —
d) heels	5,100,622 —

	Crowns
e) hollow goods, of all kinds, dipped and patent goods except balls and toys	1,336,757 —
f) „It-Platten“ (packing)	1,275,120 —
g) bicycle tires and inner tubes	3,192,779 —
h) automobile tires and inner tubes	7,269,413 —
i) solid tires for automobiles and carriages	2,391,494 —
k) hard rubber goods of all kinds	1,402,776 —
l) toys and balls	2,202,810 —
m) rubber cloth and articles made therefrom	2,555,585 —

7. Leather and manufactures of leather.

The production of sole leather has always been carried on in the Austrian tanneries, and under normal conditions the sole leather industry would be capable of export in all directions, with regard to quality as well as quantity. The production of upper leather has taken a great leap, especially in recent years, but is not yet in condition entirely to cover the home demand, so that large imports, which have come hitherto especially from Germany are necessary. The same is true of the finer sorts of leather that are used chiefly for fancy goods. In the three post war years the sole leather industry has been in a difficult position with regard to a supply of raw hides, to say nothing of the general difficulties of operation. The raw material has hitherto been secured in great part from the Succession States but in part also from other foreign countries and from overseas.

In the way of tanning material fir tree bark (Fichtenrinde) is found in Austria in great quantities so that it appears to be available for export. On the other hand, the domestic production cannot fully cover the need of tanning material for upper leathers (chrome salt). There is a need also of tanning material from overseas such as Quebracho, divi-divi, valonea, etc. Oak bark, which was formerly an important export article of Austria-Hungary, is not found in Austria. It was produced, for the most part in Croatia and Slavonia.

The largest firms in the tanning industry are: S. & J. Flesch, Wilhelmsburg; Flesch, Gerlach, Moritz, Vienna II; Franz Riek Söhne, Graz; Franz Schmid A. G. Krems; Lederfabrik Adler, Wels; Gerhardus & Söhne A. G. Vienna II; Fr. Vogel, Mattighofen; Rudolf Löw-Beer, Vienna-Stadlau; Gebrüder Strasser Vienna XIV (glove leather); Gustav Pollak, Atzgersdorf near Vienna,

As dealers in tanning material, we may name: Gerhardus & Söhne, Aktiengesellschaft Vienna II; Brüder Allina, Vienna II.

A very important export article of Austrian industry is found in fancy leather goods. Vienna has always found everywhere a ready market for these, on account of their good taste and fine execution; and has enjoyed an excellent reputation in the markets of Western Europe, in which competition is so active. As firms which are especially to be considered for the export of fancy leather goods we may name: Hochmuth & Gerstmann, Vienna I; G. Walker & Co., Vienna VII; Erasmus Atlas, Vienna VII; M. Würzl & Söhne, Vienna I; Rabl & Grün, Vienna VII.

For leather bags and trunks: Josef Nigst & Sohn, Vienna I; Franz Zeller, Vienna VII; J. & J. Hackenberg & Kirchmayer, Vienna VII.

The leather belting factories work for export to a considerable extent, and have a large production. The most important firms are: Lederfabrik Adler, Wels; J. Lenhardt and Wögerbauer, Vienna VI.

The factory production of shoes, which before the war was situated for the most part in Czechoslovak territory, developed in Austria very quickly during the war, so that the shoe factories are today quite capable of export. The largest shoe factories are: Brüder Klein, Mödling near Vienna; Allgemeine Oesterreichische Schuh-Aktiengesellschaft, Vienna VII; Mattausch & Haneschka, Vienna VII.

The export of fancy shoes is also very important, and in this branch the Austrian products, as in the case of fancy goods in general, enjoy an excellent reputation and find a market everywhere. Export firms in this branch are: Max Altschul, Vienna VII; and Viktor Koch, Vienna VII. For the export of house shoes: Duschnitz Adolf, Vienna I.

8. Chemical Industry.

Austria's chemical industry was greatly developed during the war as the government factories for explosives and powder situated in Austrian territory were much enlarged on account of their central location. These plants are now being made over for chemical industry on a large scale and most of them have already begun operation. The electrochemical industry in

Austria has very favorable prospects on account of the available water power (Brueckl, Landeck, Patsch). The great pharmaceutical industry is located especially in Vienna and its immediate surroundings. Vienna plays an important part in the trade in chemicals and particularly in pharmaceutical products and dyes since this trade passes in part through Vienna from Germany and Czechoslovakia to the Succession States and the Balkans. The following table shows Austria's possibilities in certain leading articles:

Sulphuric Acid	10,000 tons
Soda	40,000 „
Caustic Soda	3,600 „
Calcium cyanamid . . .	15,000 „
Sulphate of Copper . .	5,000 „

The most important companies are: Chemische Fabrik Wagemann, Seybel & Co., Vienna; Pulverfabrik Skoda-Wetzler A. G., Vienna; A. G. für chemische Industrie, Vereinigte Drogengroßhandlung G. & R. Fritz-Petzoldt & Süß A. G., Vienna; Philipp Roeder-Bruno Raabe A. G., Vienna; Solway Werke, Ebensee; Vereinigte Chemische Fabriken Kreidl, Heller & Co., Vienna.

9. Magnesite, Cement, and Brick.

a) Magnesite.

One of the most important natural resources of Austria is the abundant magnesite. Its importance is the greater since reasonably workable magnesite has not been found elsewhere in Europe, except at two places in Slovakia, now a part of Czechoslovakia, so that Austria-Hungary had in its time a practical monopoly of this article. (Note by the translator: call attention to Greece, California and the State of Washington.)

The most important deposits in Austria are near Veitsch, in North Styria, and in the region around the Millstädter See, a lake in Carinthia. In the year 1913, the total production of magnesite amounted to about 220,000 tons. Of this, only a small part was disposed of in the territory of the present Republic of Austria, by far the greater part being exported.

The most important companies, with their capacity of production and disposition are:

1) The Veitscher Magnesitwerke-A. G., in Vienna, with 4 mines in Veitsch, Trieben, Breitenau, and Eichberg. Their yearly capacity amounts to 80,000 tons of calcined magnesite and 40,000 tons of magnesite bricks. Of this production, 8% was disposed of within the country and 92% exported, chiefly to Germany, France, Italy, America and England.

2) The Österreichisch-Amerikanische Magnesit-Gesellschaft m. b. H. at Radenthein, Carinthia, with a yearly capacity of 70,000 tons calcined magnesite and several thousand tons caustic magnesite. The company was founded by the American Refractories Company, which makes magnesite bricks. The greater part of its production is exported to America.

3) The Magnesitindustrie-A. G. with mines in Oberdorf and Arzbach. Its yearly capacity is 30,000 tons calcined and caustic magnesite. Its export is chiefly to Germany, England and France.

4) The Magnesitwerke Eichberg-Ans-Gesellschaft m. b. H., having its mine in Eichberg with a yearly capacity of about 8000 tons of calcined magnesite, produces exclusively for export.

Besides the above named concerns, magnesite is produced in Central Europe only by the Magnesit-Industrie A. G. which still has its seat in Budapest with a yearly capacity of about 70,000 tons of calcined magnesite and the Allgemeine Magnesit-Industrie-A. G. in Bratislava (Preßburg), Czechoslovakia, with a yearly capacity of 30,000 tons of calcined magnesite.

b) Cement.

The Austrian cement industry which rests upon abundant deposits of the necessary raw material, has a productive capacity, yearly, of about 750,000 tons, and since the domestic requirements may be taken at about 500,000 tons, it could export 250,000 tons.

At present, this industry is struggling with great difficulties, especially on account of the bad transportation situation, so that it can hardly supply the domestic need, though the latter is unusually small. With normal conditions of production, the cement industry would have great markets in Italy, Holland and Switzerland. The territories of the other Succession States also produce cement in great quantity and could themselves export.

The largest Austrian concern is the Perlmöoser Zementfabriks-Aktiengesellschaft, in Vienna, with works all over the Republic. Their yearly capacity of production amounts to 400,000 tons. In connection therewith may be mentioned Ludwig Hatschek in Vöcklabruck who operates a factory of "Eternit" slate, and in Gmunden, cement works with a yearly capacity of about 70,000 tons.

c) Brick and tile.

The brick and tile industry of Austria includes in all 785 establishments, of which 471 operate portable kilns (Feldöfen) and 314 annular kilns (Ringöfen). The „Ringöfen“ brickyards operated 390 kilns on an average, during the years 1911 to 1913 and produced on the average, 834 million bricks. The present great diminution of production is due to the great diminution of building in the country. With a restoration of half way normal conditions of production, there would come the possibility of a considerable export, especially of high grade roofing tiles. As large undertakings of this branch of industry are to be named the Wienerberger Ziegelfabriks- und Baugesellschaft, Vienna; the Ziegelindustrie-Aktiengesellschaft Vienna, and the Aktiengesellschaft der Wiener Ziegelwerke, Vienna.

10. Mining.

Iron ore, coal, salt, and magnesite are considered in separate chapters. Unfortunately, the Alps are not very rich in other minerals, so that importations of the most important minerals are still necessary.⁷

There is in the Alps a very productive copper mine, the Mitterberger Kupfer A. G., near Mitterberg, in Salzburg. In the

⁷ Mitteilungen über den österreichischen Bergbau, II. Jahrgang, published by the Staatsamt für Handel und Gewerbe, Industrie und Bauten, Vienna 1921; Dr. Hans Höfer: Die Erzvorkommen in den deutschösterreichischen Alpen (158. Band der Schriften des Vereines für Sozialpolitik, München 1919, page 71); Dr. H. Tertsch: Erzbergbaue Österreich-Ungarns, Vienna 1919; Wirtschaftsstatistische Materialien, I. c. table 27; Dr. Lukas Waagen: Bergbau und Bergwirtschaft (Wirtschaftsgeographische Abhandlungen zur Wirtschaftskunde der Länder der ehemaligen österreichisch-ungarischen Monarchie, published by Prof. Dr. Franz Heiderich, Vol. 10), Vienna 1919.

year 1915 with 854 workmen, 72,000 tons of copper ore was produced which was smelted in the copper furnace at Ausserfelden. The production is, however, not able to cover the Austrian requirements of copper, so that a considerable amount must still be imported.

Most of the Austrian lead and zinc ore is produced by the Bleiberg-Kreuth mine in Carinthia, owned by the Bleiberger Bergwerks-Union. At this mine, in the year 1915, there were produced 8600 tons of lead ore and 725 tons of zinc ore. The lead ore was smelted in the Gailitz furnace of the company, the zinc ore had to be sent out of the country to be smelted. The deposits of Raibl have unfortunately been awarded to Italy by the Treaty of Peace, and the still more productive ore beds and furnaces of Miess and Schwarzenbach to Jugoslavia. Smaller mines exist in Styria (Ludwigshütte Bergbaugesellschaft in Rabenstein) and the Tyrol (Gewerkschaft Silberleithen, near Biberwier und Gewerkschaft Dirstentritt in Nassereith).

Deposits of sulphur ore are found in the Alps. The ore mined in year 1920 amounted to 22,000 tons with a sulphur content of about 3300 tons; but Austria remains dependent upon imports because of its great requirements for industrial purposes, especially for the manufacture of paper and chemicals. These imports have for the most part come from Spain.

The production of graphite has hitherto exceeded the domestic demand, so that considerable quantities can always be exported. The greatest deposit of graphite is found in Styria at the productive mine at Kaiserberg near St. Michael a. d. Mur, and in the northwestern part of Lower Austria. The production of crude graphite in the year 1920 was 11,500 tons.

The mining of oil bearing shale is carried on at present on a considerable scale in the Tyrol.

The mining of gold ore (Gewerkschaft Rathausberg, Rathaus mountain near Boeckstein in Salzburg) has recently been very much increased because of the high price of gold.

Nickel, manganese, silver, antimony, quicksilver, tin, and ferrotungsten are not produced in the country, at least in any considerable quantities, so that the domestic demand must be covered by importation.

11. Provisions. (Sugar, salt, beer, and malt, flour, alcohol and compressed yeast.)^s

a) Sugar.

The sugar industry of the former Austro-Hungarian Monarchy is for the most part in the other Succession States. Czechoslovakia has the greatest share. Only four sugar factories have remained in Austria, namely, a factory of the Leipnik-Lundenburger Zuckerfabriken A. G. in Leopoldsdorf; a factory in Hohenau, belonging to the firm of Gebrüder Strakosch; the factory of the Österreichische Zuckerindustrie A. G. in Bruck a. d. Leitha; and the Dürnkruter Zuckerfabriks A. G. Vienna.

These four factories together produced in the season 1920/1921 a total of 13,700 tons or about 10% of the normal sugar requirements of Austria, the production having sunk to this very small quantity on account of the great reduction in the production of sugar beets, as a result of the lack of fertilizers, and on account of the oppressive scarcity of coal. But even with a return of completely normal conditions, the Austrian sugar factories would be far from able to supply the need of Austria itself, for taking the normal per capita quota of 1913, that is 13.2 kilograms, and assuming full operation of the sugar using industries, Austria would require 125,000 tons per year, while the four Austrian factories have produced under the most favorable circumstances little more than 40,000 tons on the average. So Austria will be always dependent on the importation of sugar. The industries that use sugar as a material have always produced more than was required in the territory of the present Austria and exported especially to the Succession States and the East, but also in considerable quantities to the West. Since the war, these industries have suffered especially severely from lack of raw material, so that the exports must be considerably reduced. The largest firm in this business is that of Gustav & Wilhelm Heller, in Vienna, whose products went to all European lands and to North and South America. Other firms are: Victor Schmidt & Söhne, Vienna; Josef Mauner & Co. A. G., Vienna;

^s See: Wirtschaftsstatistische Materialien a. a. O., table 28 to 34. Die Volkswirtschaft der Nationalstaaten, published by the Allgemeine Depositenbank, Vienna 1921.

Josef Küfferle & Comp., Vienna: Gebrüder Stollwerck, Vienna:
Julius Meinl A.G., Vienna.

b) Salt.

The salt produced in the former Austria was about 330,000 tons annually and of this 160,000 tons was produced by the Alpine salt works in Bad Ischl, Hallstatt, Ebensee, Bad Aussee, Hallein and Hall-in-Tirol, all of which are situated in the present Austria. With the extensions and additions that have been made in the last years the capacity of the Austrian salt works can now be reckoned at about 200,000 tons per year, of which, with a normal domestic consumption of 100,000 tons, (60,000 tons table salt, 20,000 tons cattle salt, and 20,000 tons factory salt) approximately 50%, that is, 100,000 tons, will be available for export.

But since this salt, on account of impurities, cannot be obtained directly, like the rock salt in Germany, but only through lixiviation of the salt rock and evaporation of the brine, the salt production is dependent upon the supply of fuel. On that account in the years since the war production has had to be limited to 30 — 40% of the production in time of peace, and the large sums that under normal conditions could be realized from its export have been lost to the balance of trade.

c) Beer and Malt.

The industry of brewing and malt production presents the typical picture that meets us ever and again in the different food industries. In the old Austria these industries were highly developed but on account of the supply of raw material and cheap labor they had their seat preeminently in German Bohemia (Sudetenländer) and Galicia. The territories of the Austrian Republic never had more than a comparatively small part of the brewing and malt industry. At present these few companies are in a difficult situation on account of the impossibility of continuing the supply of raw materials which they always got from the regions that now belong to the other Succession States, and they are working to only a fraction of their capacity.

Taking up the data of the brewing and malt industry, we see that of the beer produced in Old Austria, 22 million hecto-

liters yearly, a third belongs to the present Austria, (211 breweries with 7 million hectoliters production in normal times). With respect to the chief raw material, barley, the breweries that are now in Austria could in time of peace get only 30 % of their requirements, which amount to 160,000 tons, from the territory of the present Austria, while the remaining 70 % was brought from the territories of the other Succession States.

The largest establishments, with their normal yearly production are as follows:

Vereinigte Brauereien Schwechat, St. Marx, Simmering, Dreher, Mautner, Meichl A. G. Vienna (585,000 *hl*); Brüder Reininghaus A. G. für Brauerei und Spiritusindustrie, Graz (430,000 *hl*); Erste Grazer Aktien-Brauerei, vorm. Franz Schreiner & Söhne, Puntigam (355,000 *hl*); Aktiengesellschaft der Liesinger Brauerei (362,000 *hl*); Gösser Brauerei A. G. vorm. Max Kober in Göss near Leoben (291,000 *hl*).

In like manner, of the malting establishments of Old Austria, whose yearly production amounted to 240,000 tons and which exported 4/5 of their production, only ten establishments with a total production of 17,000 tons malt are in Austria. The greater part of the production comes from the two large establishments Hauser & Sobotka A. G. Vienna-Stadlau, and Anton Iritzer, Vienna (15,200 tons). Only 10 % of their supply of barley comes from the present Austrian territory, and 90 % from Czechoslovakia.

Both industries, brewing and malting, which were severely limited during the war, are at present in a difficult position, and the only hope is that an "improvement trade" (Veredlungsverkehr) e. g. the furnishing of barley in return for an export of malt, or the furnishing of barley or malt against the exportation of beer, may be introduced on a large scale in these industries, as similarly in other food stuff industries, and so give these domestic and highly developed industries the possibility of new growth.

d) Flour.

The Austrian milling industry includes about 400 establishments, with a capacity of 1 million tons per year. Among these are three large establishments, namely: D. Kellner in Schwechat

(daily capacity 260 tons) Schoeller & Co, Vienna and Ebenfurt (daily capacity 340 tons) and Vonwiller & Co, Vienna (daily capacity: 300 tons).

The production of these mills under normal conditions can supply the need of Austria. In peace time a certain amount of very fine wheat flour produced by the power mills in Hungarian territory was exported to the West and to what is now Czechoslovakia. At present normal consumption is much reduced on account of the general limitations, and since the greater part of the grain imported is already ground, the domestic milling industry is employed to only a very small part of its capacity. In normal times the mills produced an very fine white flour, which was exported in great quantities to the territory of the present Czechoslovakia and also to France.

c) Alcohol and compressed yeast.

The alcohol production of the former Austria was larger than the domestic consumption, and considerable quantities could be exported. But even before the war the territory that now belongs to the Republic of Austria was not able to supply its needs by its own production, and had to draw great quantities of alcohol from German-Bohemia and Galicia, where the industry had its chief seat on account of the availability of the raw materials: potatoes, beets and molasses. The capacity of the 26 distilleries which are now in Austrian territory is 134,000 hectoliters while the consumption in time of peace amounted to 427,000, so that Austria under normal conditions must import 293,000 hectoliters. At present, on account of insufficient supply of raw materials: the production of alcohol is much reduced. Since grain, potatoes etc. are generally required for food and cannot be used as raw materials, the industry must adapt itself to the use of imported inferior maize.

The yeast industry of the Republic of Austria, which is in close connection with the alcohol industry, has a capacity of 15,000 tons per year. The whole production of the establishments in former Austria amounted to 18,000 tons, so that in this branch the greater part of the production of former Austria is in the territory of the present Republic. Before the war, the compressed yeast industry of Austria supplied most of the Succession

States with its products, and today, with a sufficient supply of raw materials, there would be a great possibility for export.

The two largest firms of the alcohol industry are: Wilhelm and Gustav Löw in Angern, and the Landwirtschaftliche Spiritusbrennerei in Pernhofen. In the compressed yeast manufacture are the firms of A. G. Ignaz Kuffner & Jakob Kuffner, Vienna; Vereinigte Mautner'sche Preßhefe-Fabriken, Gesellschaft mit beschränkter Haftung, Vienna; M. Fischl's Söhne, Vienna; L. Harmer & Co Gesellschaft mit beschränkter Haftung, Spillern.

12. Arts and crafts and various other industries.

In the following pages a number of industries are treated in which the material is less important than the artistic work.

The production of artistic articles of all kinds has ever been cultivated in Vienna, the old art city, with its unusually gifted workmen and an artistic production that has been stimulated for centuries by the life of the court; the arts and crafts of Austria have rightfully enjoyed a world renown. Before the war its costly articles were quite capable of competing in all the West European markets. With the domestic impoverishment resulting from the war, the arts and crafts must today work more than ever for export, and especially for Western Europe, and they have recently begun in greater measure to win overseas markets, especially in North and South America, for their high priced productions. The cheaper articles have hitherto been disposed of in the territory of the former Austro-Hungarian Monarchy and in great quantities in the East.

Because of the special nature of the work, production is carried on mostly on a small scale by single artists or in small workshops. Nevertheless, there exist a few larger establishments that are artistically led and carry on the production of art objects, cultivating especially trade with foreign countries, for which they are able to offer a proper commercial handling and the necessary guarantees. Under this heading are to be mentioned: Oesterreichischer Werkbund, Vienna I. and Wiener Werkstätte Gesellschaft mit beschränkter Haftung, Vienna I. Both of these establishments extend their activity to all branches of art handiwork. The following are some of the larger firms that

make a specialty of particular articles, and are to be considered in export business:

Silverware. G. A. Scheid, Vienna VI, J. G. Klinkosch, Vienna II, Alexander Sturm, Vienna VII, Eduard Friedmann, Vienna VI.

Metal goods. Berndorfer Metallwarenfabrik Arthur Krupp, Vienna I.

Bronze castings. Erzgießerei, Bronze- und Metallwarenfabriks-Aktiengesellschaft, Vienna VIII.

Lamps. R. Dittmar, Gebrüder Brünnler, Aktiengesellschaft: Lampen- und Metallwarenfabrik, Vienna X.

Building and art ceramics. Schleiss & Co., Gmunden; Vereinigte Wienerberger Ziegel-Aktiengesellschaft; Friedrich Goldscheider, Vienna XVIII.

Lace. Verband österreichische Hausindustrie, Vienna I; Vereine zur Hebung der Spitzenindustrie in Österreich, Vienna I.

Feather ornaments. The manufacture of ornaments from feathers which are imported by way of London and Paris is carried on especially for export. The chief market is in Germany and in Western Europe. The larger firms are: D. Metzner & Co. Vienna VI, Steiner & Adelberg, Vienna VII, and Sigmund Steiner, Vienna I.

Musical instruments. As a musical center Vienna has especially cultivated the manufacture of musical instruments, and has developed a production far beyond its own needs, so that, for example, only 10% of the pianos produced were sold within the country while the rest went to the Succession States and to more remote foreign countries. The best known productions are those of L. Bösendorfer, Vienna; Friedrich Ehrbar, Vienna; Laubinger & Kloß, Vienna; Hofmann & Czerny, Vienna.

Buttons. The production of buttons from mother-of-pearl, bone, horn, and galalith has had its foreign market hitherto for the most part in Germany which was a customer for its clothing manufacture and also an intermediary for an extensive trade with other countries, and which for its part, supplied Austria with the raw materials obtained from their sources overseas. At present besides this German business, direct relations with the western markets are slowly beginning to develop. The largest factory, in the mother-of-pearl branch is the firm of Ferdinand Mayer; in horn and galalith, the firm of Gries & Klein, both in Vienna.

Moving Picture and Film Industry.

Austrian film manufacture has reached a high grade of development technically and artistically within a short time. In this it has been aided by the talents of the people, the beauties of the city of Vienna, so rich in historical traditions and old buildings, and the nearness of the Alps, which are adapted to motion picture settings. In accordance with present tendencies, great spectacular films are most favored. The present production of large films can be put at 120 per year, and at the present high cost of production, this represents a sum of about 800 million crowns a year. The films find a market in all parts of Europe, preeminently in the territories of the Succession States, but also to an increasing extent in the West. Since the end of the war special efforts have been made to interest the American market in the Austrian film industry and with this end in view a number of connections with large American firms have been made. The largest Vienna firms are the Sascha-Filmindustrie A. G., Das Kino, Mondial and Micheluzzi & Co.

Besides film producing, Vienna is of special importance in the business of renting and dealing in films. Before the war the whole territory of Austria-Hungary was served by the Vienna establishments. At present the business is much hampered, but in spite of all the hindrances, Vienna is still almost the sole intermediary for the trade between the Succession States and foreign lands. Besides the Succession States, a rich field of activity is offered to the companies that handle films in Poland and in the Balkan States. In all, there are about 30 Austrian companies that rent and deal in films. The largest are the Collegia-Sascha-Film-Aktiengesellschaft, Das Kino, Micheluzzi & Co., and Hugo Engel.

13. Raw material required.⁹

Only a few industries are in such a favorable situation as to be independent of the importation of foreign raw materials. The highly developed iron industry is based on great domestic deposits

⁹ See the article Raw materials and other products required for Austrian industry in the Vienna periodical "Reconstruction", No. 5, dated November 1, 1920, which contains information in figures on the need of the different raw materials.

of iron, but most of the other metals are found within the country only in insufficient quantities. Of other minerals, the deposits of magnesite are important for the export trade, and graphite also is exported, although not to any great amount. The salt industry is founded on the deposits of salt bearing rock in the Alps. But all other food industries are dependent for the most part on the importation of foreign raw materials because of the unfavorable condition of agricultural production. The highly developed wood manufacture and the paper industry are built upon the yield of the extensive forests. Brick, tile and cement offer great possibilities of production and would be available for export under certain conditions. In this connection are to be mentioned also those industries in which the raw material plays a subordinate part, while their products owe their chief value to the work and skill employed in their manufacture. To these belong a whole series of artistic occupations, the art printing and lithographing establishments, the production of fancy goods, and finally the motion picture industry.

A great part of the Austrian industries formerly obtained their raw materials from the different parts of the former Austro-Hungarian Monarchy: Hides and tanning materials for the leather industry came from Galicia, Bohemia, Hungary, and Croatia; the raw materials for textiles, hemp and wool, were supplied in certain quantities from Galicia and Hungary; the tobacco industry obtained great quantities of cigarette tobacco from Bosnia; quicksilver and lead were furnished by territories of the present Yugoslavia. Above all, the food industries, brewing, malting, confectionery, compressed yeast, and alcohol manufacture, obtained their raw materials to a very large extent from the agriculturally developed territories of the Succession States. These latter industries in particular still find the greatest difficulties in getting their supplies.

As regards the need of supplies of raw materials from abroad the textile industry is first to be mentioned, and further the rubber industry and the metal industry with its requirements of antimony, copper, nickel, tin, aluminium and the different high priced metals such as vanadium and ferromanganese. The leather industry must import the finer kinds of leather and part of its tanning material. Sulphur, asbestos and lacquers came for the most part from foreign countries.

Numerous branches of these industries which are dependent on foreign raw material work chiefly for export, above all the electrical, rubber, chemical, cotton spinning and leather industries, and the arts and crafts. The cost of raw materials that must be bought in foreign countries with good money is fully covered by the products made from them, which represent a value many times that of the raw material, and so it has been possible in many cases to establish a finishing trade (*Veredlungsverkehr*) in order to make it easier to obtain the raw material which would require very large sums of money on account of the depreciation of the Austrian currency. Both government and private industry have done everything to further and facilitate the development of a trade of this kind.

A law provides security for a foreigner who sends raw material to Austria to be worked up and improved: the foreigner remains the owner of the raw material and of the products made therefrom, and as such enjoys a preference over other creditors of the manufacturer. The raw materials and the finished goods must be kept separate and marked plainly as the property of the foreigner, in order to enable him to take possession of them at any time. Special books are kept in the Chambers of Commerce, in which the deliveries made by the foreign owners of raw materials are entered at their request. And finally the government has undertaken not to requisition the goods that are produced in the course of such improvement trade. The agreement between the two parties may require that a portion of the products, corresponding to the value of the raw materials that have been furnished, shall be sold in foreign countries in order to insure realizing enough sound money to pay for the raw materials.

A great many private enterprises devote themselves chiefly to establishing connections between foreign producers and dealers in raw materials and Austrian manufacturers.

The Creditanstalt in Vienna, which is in close connection with the American banking house of Kuhn, Loeb & Co. has established an institution of its own, the Allgemeine Warentreuhand-Aktiengesellschaft, Vienna IV, which, besides bringing about connections between foreign interests and domestic manufacturers, has the special function of watching over the manufacture of

such raw material, according to the instructions of the purveyor in all its stages, in order to protect in every way the rights of the foreigners.

With the cooperation of the government, the "Treuga" Aktiengesellschaft, Vienna III, for improvement trade and for disposing of goods as trustee has been created. Its object further is to utilize the credits that are granted to Austria for the purpose of providing raw materials, by placing them at the disposition of the domestic industries. For the purpose of interesting private foreign capital in the reconstruction of Austria it has founded in connection with the "Rotterdamsche Bankvereeniging" in Holland, a bank of its own, the "Reconstructiebank voor Oostenrijk" in the Hague with a capital of 12 million Dutch Gulden, in which both institutions participate equally and into which thus far each has paid 2 million Dutch Gulden.

In order to act as intermediary in procuring textile raw materials the Gesellschaft für Baumwollverwertung A.G., Vienna IX has been created. It will limit its activities to those business transactions which concern the textile industry.

In order to prepare the way for intimate business relations between England and the Succession States that have arisen on the territory of the Austro-Hungarian Monarchy, the foundation of a great English company, the Anglo-Danubian Association, has been planned. In this undertaking, which at present has a committee in London studying the question, some 16 of the leading English acceptance houses are to participate.

IV. Power.

The greatest disadvantage under which Austria's economic life labors is the lack of the sources of power required for the operation of industry and for the maintenance of transportation and traffic. Coal and petroleum can be obtained only to an insignificant extent within the territory of the State. They were available in abundance and at cheap prices, so long as the coal mines of the present Czechoslovakia, under a united leadership of economic and traffic policy, delivered their products to Austrian territory, and the Galician oil wells protected by import duties against world competition found their customers in Austria. The downfall of the Empire, the different grouping of the interests of the producing territories, the diminution of production and the consequent scarcity, often in the producing region itself, and finally the break down of the transportation system, suddenly stopped imports in 1918 and brought Austria into a relatively unfavorable position, all the more so since its industries, suffering under the difficulties of production that prevail in the whole world, the disinclination to labor, and the lack of raw materials, were already contending with the tremendous difficulties arising from the division of the country and consequently of their former markets. Electric energy from abundant water falls could not at once be drawn upon as a substitute since, though their development has been at once begun, they will not be able to furnish the energy that now is lacking for several years, and then only in part. In the following pages we shall show to what extent the domestic coal production can offer a substitute, to what extent operation had to be limited in the years following the war, and finally to what extent the water falls can be regarded as a source of power for the future.

1. Coal.¹⁰

The monthly requirement of coal amounts, according to the statistics of the last year of peace, 1913, to 1.1 million tons of coal and 110,000 tons of coke, distributed as follows:

Railways and shipping	343,000 tons
Gas, electrical and water works	128,000 "
Domestic use including private households and public institutions	330,000 "
Iron and metal industry	188,000 "
Other industries	170,000 "
	<hr/>
	1,159,000 tons

The coke is used mostly for the blast furnaces of the iron industry and for building industries.

Against this normal requirement of 1.1 million tons of coal and 110,000 tons of coke there is now an average coal production of about 240,000 tons per month in the Austrian Alpine Provinces. In the year 1919, production sank far below this amount, and only at the beginning of 1920 did it again reach nearly the height of 1913. Besides it is an especially unfavorable circumstance that the domestic coal is of very bad quality. Only 5% of the production is black coal while the rest is brown coal or lignite, whose quality for the most part is much inferior to that of the North Bohemian brown coal.

The greatest producers in Austria are the Graz-Köflacher Eisenbahn- und Bergbaugesellschaft A. G. in Styria with its mines near Voitsberg, Köflach, Wies and Steyregg (533,000 tons in 1920) and the Wolfsegg-Traunthaler Kohlenwerke A. G. in Upper Austria (445,000 tons in 1920). The Alpine Montangesellschaft, whose mines in Leoben and Fohnsdorf produce the most valuable Austrian brown coal, uses the coal obtained (623,000 tons in 1920) almost entirely in its own works. Black coal is produced only in Grünbach in Lower Austria, (115,000 tons in the year 1920) and this too is of medium quality.

Recently, under the pressure of necessity, they have begun to increase the domestic production even though of inferior coal by extension of the existing mines and the opening of new mines, but because of the poor quality of the coal and the small

¹⁰ See Dr. Wilhelm Petraschek, *Die Kohlenlager und Kohlenbergbaue Österreich-Ungarns*, Vienna 1920.

extent of the veins the domestic mining can never be extensive enough even half way to cover the needs of Austria. Vienna alone required in the year 1913, for operation of its gas and electric works and for domestic use 220,000 tons of good coal monthly which cannot be supplied through home production. The production of coke, which is so important for the iron industry, is impossible with domestic coal, and for this Austria will always be entirely dependent on foreign countries.

Austria must import more than 80 % of its requirements of coal from foreign countries, hitherto most of it has come from Czechoslovakia and Germany (Silesia). The greater part of the Austrian requirements came under normal conditions from the Succession States. Decrease of production, the breakdown of transportation, and certain inner difficulties of many kinds in the producing countries have brought it about that Austria thus far has received only a small part of the quantities that it needs. The shipments that arrived in the last three months of 1919 amounted to only 1/4 of the normal need. On an average only 40 % of the normal demand could be covered in 1920 and it is only recently that there has been some improvement through imports from abroad. The difficulties in obtaining coke have been partly overcome by a pooling of interests between the Austrian and German industries.

On account of the need of importing from abroad, the depreciation of the currency has been clearly shown in the prices paid for coal. 327 crowns on an average had to be paid in 1920 for coal which in 1913 cost 3.29 crowns at the warehouses in Vienna. It must be noted also that these deliveries from abroad, which at the present time seem easily obtainable on account of the general surplus of coal, depend on all sorts of possible circumstances. In the last few months a strike of the miners, political disturbances in the coal districts, and derangements of transportation have often interrupted the delivery of coal and so endangered the existence of Austria.

Finally let us take a brief look at the production in the other Succession States.¹¹

¹¹ See "Die Volkswirtschaft der Nationalstaaten" published by the Allgemeine Depositenbank, Vienna 1921.

Czechoslovakia has all the production of North Bohemian brown coal, the Ostrau coal, and controls the Kladno coal, the Pilsen, Rossitz and Schatzlar coal. Its total production amounted in the year 1913 under conditions which it ought to be possible to attain again, to about 6,000,000 tons of coal and 1,600,000 tons coke in Moravian Ostrau (Czechoslovakian portion), 2,500,000 tons in the Kladno-Schlan district, 1,600,000 tons in the Pilsen district, 500,000 tons in the Rossitz district, and 450,000 tons in the Schatzlar district. The brown coal produced amounted in 1913 to 18,600,000 tons in the Brüx-Teplitz-Komotau district and 3,000,000 tons in the Falkenau-Elbogen district.

Jugoslavia controls the great brown coal deposits in the Trifail district (1,500,000 tons in 1913), and the Bosnian veins near Zenica and Kreka, and furthermore it can import easily by sea.

Hungary, since the loss of its rich mines of black coal in Petrozsény and Steierdorf, has only the Fünfkirchen mines (800,000 tons in 1913) the Totis brown coal deposits (2,900,000 tons in 1913) and the Salgo-Tarjan (2,800,000 tons in 1913). Its own production cannot supply its demand.

Poland has very rich deposits of black coal in the southwest, namely, in Karwin (1,500,000 tons in 1913) Jaworzno (2,000,000 tons in 1913) and Dombrowa (6,800,000 tons in 1913). Properly managed, these deposits could produce far more than enough to supply the home demand.

On the basis of the statistics of production in the year 1913, the yearly production of the newly formed states is as follows:

Austria	3,500,000 tons yearly
Czechoslovakia	37,500,000 " "
Poland	10,500,000 " "
Jugoslavia	3,100,000 " "
Hungary	6,500,000 " "

As a result of the splitting up of the former united economic territory, there follows a heaping up of great coal supplies in countries of small requirements, depriving great consuming regions of the necessary means of production. Through the crippling of free traffic between the several states, this unequal distribution makes itself keenly felt, and it is one of the greatest hindrances to the economic reconstruction of the states that have arisen on the territory of the Austro-Hungarian Monarchy.

2. Petroleum.

As with coal so with petroleum, which might be employed as a substitute, conditions are unfavorable for a sufficient supply for Austria. The rich wells in Galicia, which formerly produced far more than was needed in Austria-Hungary are now in foreign lands¹¹. The borings that have been undertaken in Austria in the provinces of Salzburg and Upper Austria have thus far led to no result. So Austria remains dependent upon imports to cover its whole requirement and these imports have hitherto met with the greatest difficulties in the matter of transportation.

The normal requirement of Austria in petroleum products, per year, may be estimated as follows:

Illuminating oil	50,000 tons
Oil for Dieselmotors	40,000 "
Paraffine	6,000 "
Lubricating oil	20,000 "
Gasoline	48,000 "

For the purchase of oil, the nearest producing regions are Galicia and Rumania. A supply from Rumania by way of the Danube has thus far encountered difficulties of transportation, so that it has not yet been fully established, but the route of the Danube will in any event become of the greatest importance for obtaining supplies from Baku-Batum and other oilfields overseas. Recently lubricating oils have been secured from overseas by way of Hamburg.

Within the country there are three oil refineries: that of the Aktiengesellschaft der Wien-Floridsdorfer Mineralölfabrik in Floridsdorf (monthly capacity 5000 tons with a paraffin plant), Dröisinger Petroleumraffinerie der Schodnica Aktiengesellschaft in Dröising (monthly capacity 1800 tons) and Gustav König & Co., Kagrán (for the rectification of 1000 tons of crude gasoline monthly).

Of storage plants, the largest are the Nova, Vienna, Prater-spitz, plant which is intended for the transshipment trade on the Danube. Its present storage capacity of 10,000 tons could be easily multiplied; Gerson, Boehm and Rosenthal, Fantò-Konzern

¹¹ See Robert Schwarz, Die Mineralölindustrie Österreich-Ungarns. Vienna 1919.

in Rannersdorf (6000 tons storage room), and the Feldkirch reservoir plant of the Olex-Petroleum Gesellschaft with a storage capacity of 12,000 tons.

The large petroleum companies, formerly Austrian, such as the Galizische Karpathen-Petroleum-Aktiengesellschaft, vormalis Bergheim & Mac Garvey; Galizische Naphta A. G. Galicia; David Fanto & Co.; Vacuum Oil Company; Gartenberg & Schreier, Jaslo; Schodnica A. G. für Petroleumindustrie and the Ostrauer Raffinerie, almost all of which formerly had their seat in Vienna are of interest for the present Austria only insofar as they now maintain sales offices here.

The central offices of these companies, which are coming more and more, it seems, under the controlling influence of foreign capital, will for the most part be removed to foreign countries.

However, Vienna has not lost its former importance for the petroleum business, since commerce is concentrated here more than ever, and most of the large deals, even those between the other Succession States, are made through Vienna. Furthermore Vienna is an important transfer point in the through trade, which is increasing greatly.

3. Water Power.

Attention is being more and more directed to projects for developing the great water power sites that are available in the Alps, projects that for a long time have been under consideration¹². So long as coal and petroleum were available in almost unlimited quantities and at relatively low prices, the deve-

¹² Statistik der österreichischen Elektrizitätswerke und elektrischen Bahnen, published by the Electrotechnische Verein in Vienna, 1920; L. Rosenbaum, Ergebnisse der Statistik der österreichischen Elektrizitätswerke und elektrischen Bahnen nach dem Stande vom 1. Jänner 1920, Elektrotechnik und Maschinenbau, 38. Jahrgang, 33 Heft vom 15. August 1920; Adolf Bachofen, Die Wasserkräfte Deutschösterreichs (158. Band der Schriften des Vereines für Sozialpolitik, München 1919, page 27); Mitteilungen über die Studien und vorbereitenden Maßnahmen der österreichischen Staatseisenbahnverwaltung zur Ausnützung der Wasserkräfte und zur Einführung des elektrischen Betriebes auf Vollbahnen, bearbeitet im k. k. Eisenbahnministerium, Vienna, 1917; Begründung zum Gesetzentwurf betreffend die Einführung der elektrischen Zugsförderung auf den Staatsbahnen der Republik Österreich, Konstituierende Nationalversammlung, 925 der Beilagen, Vienna 1920.

lopment of these water power sites, did not seem to offer enough profit, and the great investment required did not seem immediately necessary. Military considerations, too, were urged against the complete electrification of the Alpine railways. The difficulties which have arisen in recent years in obtaining regular and continuous deliveries of coal from the Succession States whose location permits low freight rates and from Upper Silesia, and the danger that delivery might be suddenly interrupted by a strike or a stoppage of transportation entirely apart from political motives, and finally and above all the continuous heavy debiting of the balance of trade by importing coal from abroad, make the question of the electrification of railways and industry by the aid of the water power sites that have not until now been sufficiently utilized especially pressing. It is indeed to be expected that of the present total requirement of about 15 million tons of coal a year about 7 million tons could be saved by the electrification of railways and industries and by driving all electric works by water power.

There are excellent, thorough studies of the water power sites in the Austrian Alpine provinces, which are founded on exact measurements, and are inspired first of all by the thought of electrifying the Austrian railways.

According to the results of these investigations, there are in the Alps great water power sites capable of development, to the amount of 1.7 million HP, counting as a great water power site only one that has at least 1000 HP mean yearly production. On the whole, according to conservative estimates, taking nine months water supply for calculating the mean annual production, there are in round numbers 3,000,000 HP to be derived from water power works and 2.25 million HP can be regarded as easily capable of development.

Only a very small part of these have yet been developed. In the side valleys of the greater mountain rivers there have long existed numerous developed water power sites, mostly rather simple plants, built for local needs, but in general there is a lack of great modern water power stations. The turbine output in water power stations amounted on January 1, 1920 to only 205,000 HP. On the other hand the estimated requirement of Austria in electrical energy amounts already to 1,000,000 HP.

At the present time, as already mentioned, 205,000 HP of electric current is supplied by electric works driven by water power, 245,000 HP by these driven by steam, and 15,000 HP by internal combustion engines, so that of the total production of electric energy, amounting to 465,000 HP, only 44% comes from water power, and scarcely 10% of the water power sites that are available in Austria are at present utilized.

A comparison of the Austrian electric works with those of other European States is given in the following table¹³.

Countries	Capable of development HP	Developed HP	% developed
Norway	8,000,000	1,000,000	12.5
Switzerland . . .	2,500,000	550,000	22
Italy	5,000,000	1,000,000	20
France	5,000,000	1,000,000	20
Austria	2,250,000	205,000	9.1

In considering the question of supplying electricity, two regions must be kept separate: the Provinces, and Vienna with its immediate neighborhood. In the Provinces the problem of electrifying the state railways with their great need of power takes the first place; there the amount consumed by industries and agriculture is relatively far less important and can be met by the quiet and continuous growth of smaller plants. In Vienna and its environs, which we may take to extend along the Southern Railway as far as the foot of the Semmering, there is on the contrary a great need of electricity for industrial purposes and for lighting, almost all of which is met by electricity produced by means of fuel, and this would insure standing custom for the waterdriven power plants when they are built. Here we have the surest and most necessary as well as the greatest task for the electrification industry in Austria, a task which it has unfortunately not been possible to undertake efficiently up to this time, chiefly on account of the lack of capital.

The projects hitherto discussed in connection with the building of water-driven power plants have dealt chiefly with the railways. At the same time the building of smaller plants is being briskly carried on in the Provinces so far as there is a demand for a steady industry at particular points. For example rather

¹³ See Bachofen, l. c., page 38.

large plants are building in Upper Austria on the Grosse Muehl near Partenstein, in Salzburg in the Liechtensteinklamm, in the Wiesthal and in the Fuschertal. The development of the small waterfalls for the needs of the farming population is also proceeding at a fair rate, the relatively small power plants supplying local needs being used for lighting and for driving small farm motors. The industrial district of Upper Styria with its well developed iron and paper industries deserves special attention. The plants of these industries are located within transmission radius of the greatest Styrian water power sites, on the Enns in the Gesäuse and on the many unused waterfalls on the Mur.

Of the railways, with a total length of about 6000 kilometers, only one complete road, one of 63 *km* with an alternating current of 15,000 volts, and 15 local roads, 189 *km* with continuous current and 201 *km* with alternating current, are operated electrically.

For the next five years the electrification of main lines with a length of 652 *km* is in prospect by the development of 4 water power works, namely

- a) the Arlbergbahn (division Innsbruck-Landeck-Bludenz) and the Vorarlbergbahn (division Bludenz-Bregenz-Austrian boundary [Lindau] with side lines);
- b) The Salzkammergutbahn (division Stainach-Irdning-Attnang-Puchheim);
- c) The Westbahn in the divisions Salzburg-Schwarzach-St. Veit and Schwarzach-St. Veit-Wörgl;
- d) The Tauernbahn (division Schwarzach-St. Veit-Spital-Millstättersee).

This is only a small beginning since these roads represent only $\frac{1}{7}$ of the length of the roads operated by the State (4478 *km*) and the delivery of electric current to industries is not contemplated. But even with this partial work, 435,000 tons of coal will be saved yearly and 32 locomotives and 970 coal cars will be liberated from the transport of this quantity of coal.

An increase of the production of electric energy by utilizing water power appears to be necessary above all, as we have already said, in the interest of supplying Vienna, since the electric works of that city, with their normal production of about 250 million kilowatt-hours are dependent almost wholly on the supply of Czechoslovak and German coal. For this the great

water power sites of the Danube, which according to different estimates may be put at from 280,000 to 400,000 HP, and the water falls of the Enns and Ybbs rivers, still await development. For these too there are thorough studies of several years duration according to which conditions are very favorable for the building of several plants.

In the interest of a speedy development of the water power plants it is to be hoped that foreign private initiative can be gained for the projects that are contemplated, all the more because large capital is necessary, which can hardly be raised in Austria. The cost of development was calculated in the year 1913 at 800 crowns per HP, the value of the crown being then 4.93 to the dollar, and it must today be calculated at a much higher rate on account of the depreciation of the crown. A profitable return on the investment appears to be certain, since, as shown above, only $\frac{1}{5}$ of the present ascertainable requirement of Austria is supplied by electric energy produced through utilization of water power. In this calculation, the power requirement is taken at 1 million HP, which provides for only the most necessary requirements of industrial operation and does not take into account at all the possibility of increasing industrial activity. The State has every interest in furthering the development of electric works and in supporting in every way foreigners who may take an interest therein, since, through the development of water power transportation and industry would be freed from dependence on foreign imports of coal, agriculture furthered by an increased production of artificial fertilizer and by the possibility of operating irrigation plants etc.; and Austria's balance of trade could be materially improved by the saving of costly purchases of coal.

V. Banks.

A description of the economic conditions in Austria must devote special attention to the banks, for they are an integral part of our industrial and commercial life, because of the intensive development of their activity in founding and financing undertakings, and because of the field they occupy, which reaches out far beyond the territory of the Austrian Republic and gives to Austrian economic life a considerable international importance.

As in the German Empire, the Austrian banks have regarded it as one of their chief objects to develop and centralize a powerful industry, and in this effort they have gone beyond acting as outsiders in the transformation of industrial establishments into stock companies and in their general direction, and in many cases have taken part regularly and actively in conducting the current business affairs. Thus, the sale of the whole production of certain concerns controlled by the several banks is very often carried on in the merchandise departments of the banks. Other institutions have founded separate companies for the same purpose, which they manage.

The influence of the banks upon industry and trade has gone still further in Austria than in Germany, for in the latter country a powerful industry and a considerable trade, already in existence, have only partially connected themselves with the banks, but remain in great part independent. In Austria, on the contrary, on account of the backward state of industrial development, the banks themselves had to take the initiative in furthering industrial and commercial development, and even before the outbreak of war they were leaders and guides of economic life. Through the great importance of their industrial obligations and commitments, the banks have now the greatest interest in the prosperity of industry in the territory of the old Austro-Hungarian

Monarchy, and, in order to attain this, in forming as close connections as possible with other countries. Offers for the delivery of raw materials or for founding and financing enterprises are therefore most welcome to the banks. On account of their far reaching control and because of their international relations the banks seem to be the institution best adapted for dealing with foreign countries.

The greatest banks of the Austro-Hungarian Monarchy had their chief seat in Vienna. The importance of Vienna in this respect also was greater than that of Berlin, for in the German provinces there have always been a number of financial and economic centers which only slowly yielded to Berlin. In Austria-Hungary on the contrary a development of banks outside of Vienna was encouraged only in relatively recent times and chiefly from nationalistic views. In this respect Budapest is farthest advanced. Until the outbreak of the war, the development in the Czech and Polish parts of the Empire had not progressed very far. The decision of the most important questions, especially when they had a considerable international importance, remained to the very end in Vienna.

With the political ruin of the Empire and the foundation of the Succession States, the movement of separation naturally made great progress. The few home institutions of the new states were favored in every way in all Government transactions, since further employment of the Vienna banks had to be avoided for reasons of prestige in foreign lands. In a short time those institutions had an enormous increase of their business, so large that the principle of a slow development, which seems to the experienced banker always the foundation of a sound, strong banking system, was in many instances not observed. Most of the young national institutions have been able to get the necessary support only through foreign capital, especially French.

The great Vienna banks, on the other hand, have been hindered in every way in the business of their branch offices and of their allied or subsidiary institutions. Nevertheless, on account of their ancient importance in the credit system of the regions in question, they could not be entirely excluded. Necessarily they had to accommodate themselves to circumstances by making new institutions out of their branches in the territory of the

newly established states, or by ceding their branches to local institutions that already existed with which they have established a close community of interests. But they are still able, on the basis of their former connections, although under great difficulties and limitations, to maintain their old position as industrial and financial centers. On that account Vienna, as the seat of the great banks, has remained of the greatest importance for the industry of the territories it formerly served and as the center of an important intermediary commerce it is coming more and more to the front, although immediately after the political collapse all threads seemed to be severed.

The credit system, like that of commerce, has only one foundation, confidence, which is gained only through long business connections, resting upon sound tradition and an approved basis of capital. Therefore, credit operations cannot be diverted overnight into entirely new channels and to young, often untested institutions. The great Vienna banks have ever enjoyed and justified this confidence in foreign lands in fullest measure, and they have for years carefully cultivated international relations with the great European centers of London, Paris, and Amsterdam, as well as with the eastern European and Balkan States, where their signatures are well known.

Since the great Vienna banks are thus regarded in foreign countries as old and reliable business friends, they are able to perform certain important functions for European and American customers and can be the best intermediaries with East European regions. They can do this because, through their previous business and their extensive system of branch offices, they have an excellent knowledge of places and persons not only in the Succession States but also in the Balkans, and a personnel that is technically trained in languages and otherwise for these regions. Without this support it would not be easy for the banks of Western countries which are accustomed to other business methods, to operate in Eastern Europe and in the Balkans. But the Vienna institutions can also be of particular service as intermediaries when the customary pre-war credit relations are restored since examining and passing upon credits and cooperation in the carrying out of business deals on long terms to which the western banks have not been accustomed will devolve upon them, thanks to

their knowledge of business conditions in the Succession States, the Balkans and the Orient.

Two of the large Vienna banks had branches in Paris and London before the war, namely the Anglo-Österreichische Bank in London, and the Länderbank in Paris and London. The Länderbank and the Anglo-Bank now intend to move their headquarters to Paris and London respectively. In the case of the Länderbank, which was founded by French capital and has always remained in close relation with it, preparations for this move are fairly well advanced. The Anglo-Bank which was founded in the sixties with the help of English capital, is also busy with the preparations for such a change. Other foreign capital has begun to obtain an interest in different Austrian banks through financial cooperation. For example the American banking firm of Kuhn, Loeb & Co. has acquired shares in the Creditanstalt, the Société Belge in the Wiener Bankverein; the "Mercur" has formed a close connection with the Incassobank in Amsterdam; the Wiener Kommerzbank with French capitalists. Other foreign banks, realizing that just now Vienna plays the chief part as an exchange market for Eastern Europe and can still maintain its former position as a financial center, have considered it expedient to get a foothold through subscribing to the capital stock of smaller and medium-sized private banks; we find a considerable number of such attempts not only on the part of Western and German banks but also on that of banks in the Succession States, and it may be assumed that this movement will become even more extensive.

The following table gives information regarding the condition of the banks and the most important items in their balance sheets for 1920.¹⁵

¹⁵ Regarding the condition of all the banks of Old Austria before the beginning of the war see "Die Österreichischen Banken im Jahre 1913", Mitteilungen des d. ö. Staatsamtes für Finanzen, XXIV Jahrgang, 2. Heft, Vienna, 1919. Regarding the activities of the banks during the war see the detailed article of Dr. Max Sokal in the report of Niederösterreichische Handels- und Gewerbekammer for the years 1914-1918, Vienna 1920, page 1097.

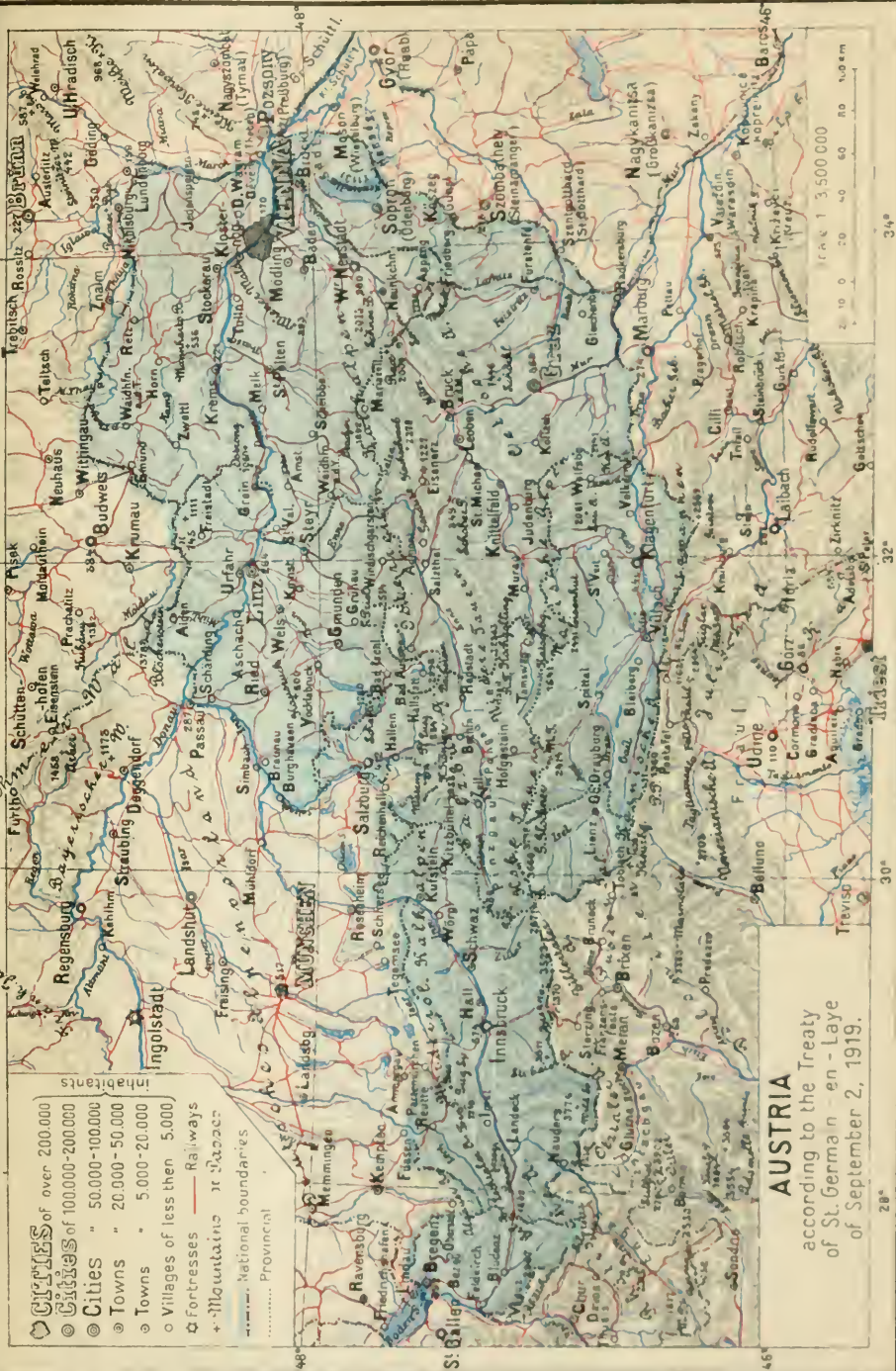
The Austrian Banks in the year 1920.

Names of the Banks	Found- ed	Capital Stock	Total Surplus	Payable	Receivable	Drafts	Salaries	Expenses	Taxes	Gross Profits	Net Profits	Dividend Gross %
Credit-Anstalt . .	1835	320,000,000	348,240,000	10,565,819,000	9,508,570,000	649,121,000	101,376,000	54,698,000	105,750,000	375,170,000	114,055,000	50—15.625
Boden-Credit-A..	1863	105,000,000	313,210,000	5,623,723,000	5,814,045,000	235,348,000	46,218,000	15,862,000	49,631,000	176,731,000	45,459,000	60—20
Anglobank	1863	200,000,000	150,930,000	12,857,503,000	11,090,113,000	516,625,000	223,064,000	114,399,000	88,051,000	496,219,000	55,683,000	24—10
Bankverein	1859	300,000,000	306,190,000	9,606,786,000	7,226,706,000	438,572,000	160,524,000	89,749,000	69,226,000	393,041,000	76,774,000	43—12
Länderbank* . . .	1880											
Escompte-gesell- schaft	1853	150,000,000	151,760,000	2,594,977,000	2,495,180,000	199,706,000	52,098,000	10,898,000	19,015,000	138,136,000	35,872,000	56—14
Depositenbank . .	1871	300,000,000	166,780,000	3,268,521,000	3,777,223,000	334,448,000	72,117,000	33,310,000	20,618,000	201,592,000	74,862,000	50—12.5
Verkehrsbank . .	1864	149,990,000	111,190,000	3,764,222,000	3,638,826,000	34,882,000	66,615,000	44,913,000	13,427,000	172,956,000	49,031,000	36—12.86
Mercur	1887	180,000,000	132,700,000	2,463,505,000	2,311,986,000	117,739,000	59,514,000	14,981,000	20,348,000	132,570,000	39,341,000	50—12.50
Unionbank	1870	150,000,000	74,170,000	2,637,407,000	2,268,581,000	180,211,000	56,239,000	21,127,000	26,575,000	137,205,000	33,417,000	44—11
W.r. Kommerzial- bank	1916	100,000,000	21,210,000	1,407,141,000	1,306,560,000	25,671,000	28,795,000	17,445,000	21,361,000	97,952,000	35,628,000	40—10
Centralbank der deutsch. Spark.	1901	80,000,000	26,520,000	2,717,411,000	2,318,340,000	33,735,000	56,738,000	28,712,000	10,565,000	111,910,000	16,204,000	32—8
Lombard- u. Es- comptebank . .	1873	100,000,000	80,590,000	1,032,644,000	958,748,000	112,602,000	5,915,000	2,275,000	827,000	18,419,000	9,267,000	20—10

* Not yet published.

- POPULATION**
 of over 200,000
 of 100,000-200,000
 of 50,000-100,000
 of 20,000-50,000
 of 5,000-20,000
 of less than 5,000

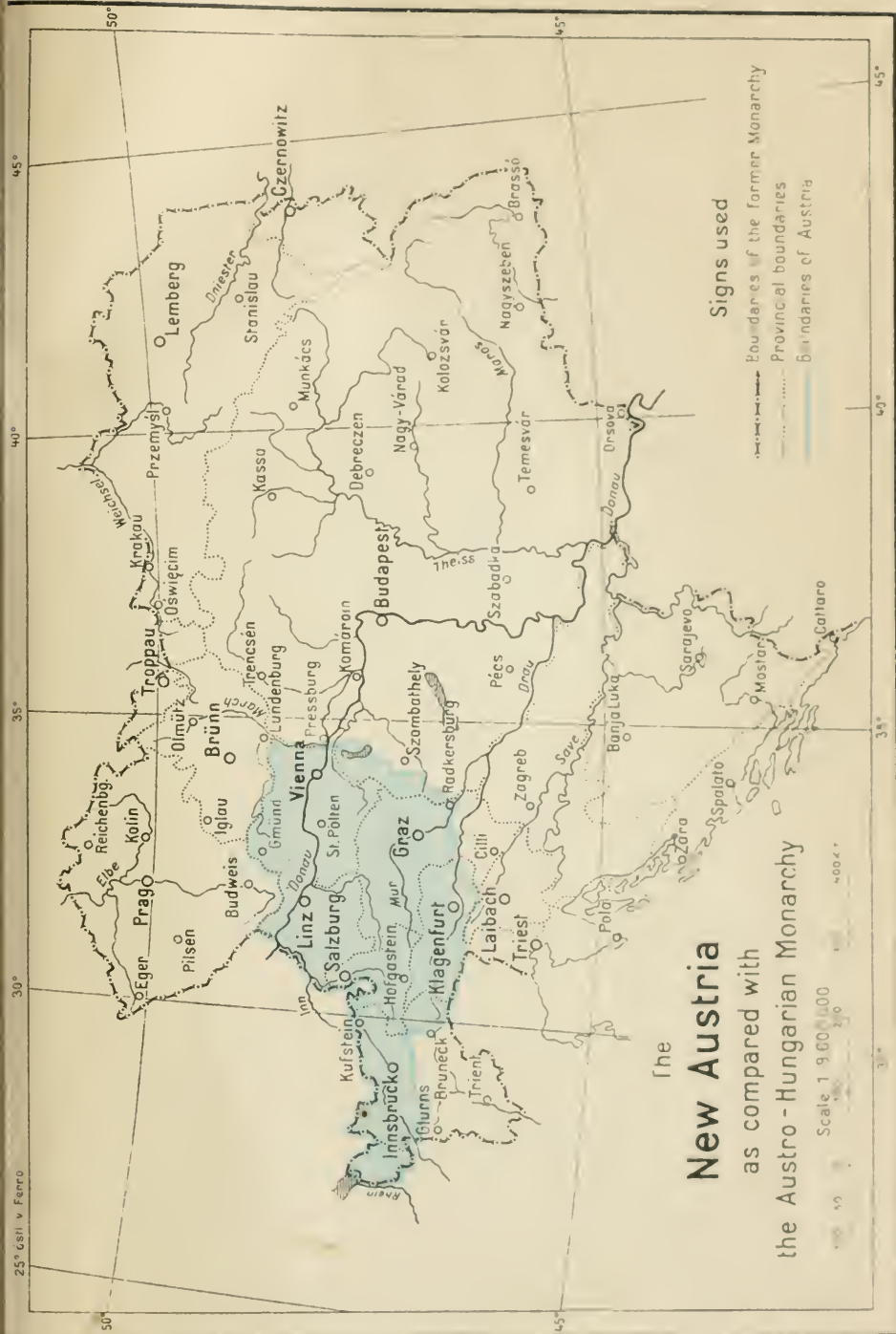
Fortresses
 Railways
 Mountains
 National boundaries
 Provincial boundaries



AUSTRIA

according to the Treaty
 of St. German - en - Laye
 of September 2, 1919.

SOUTHERN BRANCH,
UNIVERSITY OF CALIFORNIA,
LIBRARY,
LOS ANGELES, CALIF.



SOUTHERN BRANCH,
UNIVERSITY OF CALIFORNIA,
LIBRARY,
LOS ANGELES, CALIF.

SOUTHERN BRANCH,
UNIVERSITY OF CALIFORNIA,
LIBRARY,
LOS ANGELES, CALIF.

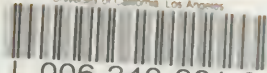
UNIVERSITY OF CALIFORNIA AT LOS ANGELES

THE UNIVERSITY

*
MANZ
PRINTING-OFFICE
VIENNA

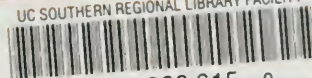
*
.

University of California Los Angeles



L 006 340 221 8

UC SOUTHERN REGIONAL LIBRARY FACILITY



AA 001 268 615 0

UNIVERSITY OF CALIFORNIA,
LIBRARY

